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SELECTED TOPICS RELATED TO THE POULTRY AND EGG INDUSTRIES

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PREFACE

This publication is a collection of selected articles about the poultry and egg industries. The purpose of these reprints is to provide a readily available source of information under one cover. These special articles originally appeared in various issues of the Poultry and Egg Situation which is published four times a year by the Poultry Program Area, Commodity Economics Division. The Poultry Program Area conducts a broad range of research activities covering every segment of the production-marketing system in addition to providing current situation and outlook information.

Further information or additional copies of this publication can be obtained from the Poultry Program Area, Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture, 500 12th St. S.W., Washington, D.C. 20250. Telephone 202-447-8342.

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PRODUCTION AND MARKETING COSTS AND MARGINS FOR POULTRY AND EGGS

by

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ABSTRACT: Production and marketing costs are expected to remain at least at current high levels well into 1975. Many of the inputs into production and marketing have increased substantially in price since 1972. These increases have more than offset the smaller gains in efficiency during this period. Many of the gains in efficiency from technological and structural innovations, which produced declining or stable costs in production and marketing from the mid-1950's well into the 1960's, now appear to have been largely achieved.

KEYWORDS: Eggs, Broilers, Turkeys, Production, Marketing, Costs, Outlook

For many years, the variations in returns received by poultry and egg producers mainly reflected year-to-year changes in output and its impact on prices. Production costs varied somewhat due to small changes in feed ingredient prices, production efficiency, and use of capacity. Marketing margins were declining to stable, tending to reflect fairly constant spreads back from wholesale levels toward the producer.

With feed ingredient prices showing much wider swings in recent years, and with prices of other inputs rising, the need to keep abreast of data on production costs and returns and marketing costs and margins has become more pressing. The Economic Research Service, in cooperation with the Georgia, Missouri, and Pennsylvania agricultural experiment stations, is conducting a program of research to develop better continuing measurements of production and marketing costs. This article is based on some inputs from that program as well as on other recent studies. Figures presented are preliminary and more indicative of relative changes than of precise levels. These series will be refined as more data are collected and analyzed.

Production Costs and Returns

Costs of producing broilers, turkeys, and market eggs reached their highest levels in many years in 1973 and 1974. Higher prices for feed ingredients, including such major ration components as corn and soybean meal, were primarily responsible. But increases also occurred for wage rates and for costs of producing or buying chicks and poults, and for fuel and supplies.

Due to improvements in genetics, feeding, disease control, management, larger unit sizes, and mechanization, production costs trended downward from the mid-1950's into the 1960's. Improvements in feed conversion, shorter growing times, and increased rate of lay were characteristic indicators of cost-reducing forces.

While costs tended to level off after the mid-1960's, gains in production efficiency were sufficient to offset some increases in factor costs. Costs varied somewhat due mainly to relatively small year-to-year changes in feed ingredient costs. But the substantial increases in feed ingredient costs in the last 2 years have, by themselves, much more than offset any further gains in production efficiency.

Feed cost increases, along with rising wage, fuel, utility, material, and interest costs, increased the cost of production. Chick, pullet, and poult prices often lag behind other costs. The rise in the non-feed component of production costs has been most noticeable in 1974.

The egg industry in late 1972, was beginning to recover from a 2-year period when market prices had averaged below total production costs. The industry experienced a good year in 1973 despite higher feed prices. But 1974 has included several months when prices were below costs.

Net returns in the broiler industry showed relatively less year-to-year fluctuation. On the average, 1973 was a

Table 1—Estimated production costs and net returns, market eggs, broilers, and turkeys, 1972-74[1]

Item	Period	Feed costs[2]	Total costs[2]	Net returns[2 3]	Feed costs as share of total costs
		(cents per dozen)			*(percent)*
Eggs	Year 1972	17.3	29.0	-2.8	59.7
	Year 1973	29.2	41.7	6.2	70.0
	Jan.-Oct. 1974[4]	30.3	44.8	-0.9	67.6
		(cents per pound)			*(percent)*
Broilers	Year 1972	9.0	14.3	-0.1	62.9
	Year 1973	16.4	22.2	2.6	73.9
	Jan.-Oct. 1974[4]	15.5	21.6	-2.1	71.8
		(cents per pound)			*(percent)*
Turkeys (heavy young)	Year 1972	13.5	20.5	2.5	65.9
	Year 1973	25.6	33.1	13.9	77.3
	Jan.-Oct. 1974[4]	21.8	30.0	-2.9	72.7

[1] Based on secondary data and incomplete data from survey. Estimated by computerized formula. [2] Weighted by monthly egg production or monthly slaughter. Broilers and turkey feed and total costs are on a live weight basis. [3] Based on farm costs converted to wholesale market values for Grade A large eggs and ready-to-cook broilers and turkeys and compared with the Grade A large cartoned egg prices for 14 Metropolitan areas, New York heavy young hen turkey price, and 9-city weighted average broiler price. [4] Preliminary.

Table 2—Estimated marketing margins, market eggs, broilers, and turkeys, 1972-74[1]

Item	Period	Assembly and procurement	Processing, packing	Intercity transportation	Wholesaling[2]	Retailing[3]
		(Grade A large, cents per dozen)				
Eggs	Year 1972	0.8	7.6	1.2	2.8	10.1
	Year 1973	0.9	8.1	1.2	2.8	10.7
	Year 1974[4]	1.2	8.9	1.5	3.2	down
		(Reade-to-cook, cents per pound)				
Broilers	Year 1972	1.0	6.2	1.1	2.9	10.1
	Year 1973	1.2	6.7	1.1	2.9	12.4
	Year 1974[4]	1.4	7.2	1.4	3.3	down
		(Ready-to-cook, cents per pound)				
Turkeys	Year 1972	0.7	6.7	1.1	3.1	12.3
	Year 1973	0.8	7.3	1.1	3.1	14.6
	Year 1974[4]	1.0	8.1	1.4	3.5	up

[1] Series prepared to show cost and profit breakdown of ERS market basket farm-to consumer orice spreads. [2] Includes warehousing and delivery to retail stores. [3] In-store functions only. On turkeys, annual averages adjusted to reflect November-December holiday price levels. [4] Preliminary estimates. Based mainly on information for January-September.

better year than 1972 but in 1974, prices have been below costs much of the time.

For the turkey industry 1972 was an in-between year and 1973 a good year, measured by net returns. But, like the other two industries, 1974 has turned out bad for the turkey industry.

Production costs for eggs, broilers, and turkeys are likely to continue high for at least the first half of 1975 because of the present feed situation and other input cost levels. The net returns outlook depends on the level of output (which is being reduced) and on the effects of supplies and prices of competing protein foods on poultry and egg prices.

Marketing Costs and Margins

Costs for assembling, processing and packing, long-distance hauling, and local distribution of poultry and eggs have risen substantially in 1974. Some of these increases began in 1973. Retail store margins, too, have widened over the last 2 years, reflecting in part increased factor costs.

Continuing increases in the efficiency of performing various marketing functions were characteristic of the poultry and egg industries for many years. The period of greatest progress in this respect was from the mid-1950's until the beginning of the present decade. The aggregate effect of various technological and structural developments was to largely offset the upward trend in prices per unit for many inputs. Thus, farm to retailer marketing margins, and the costs of the individual marketing functions associated with them, tended to decline or remain stable for many years. In recent years, however, with the gains from technological and structural changes now largely realized, with labor productivity leveling-off, and with many input prices rising sharply, marketing margins and costs have been rising.

Higher wage rates and sharply higher truck costs, mainly for fuel, began to be reflected in higher assembly and long-distance hauling costs by late 1973. These have increased more rapidly in 1974. Distribution costs, including local transportation, have also gone up in 1974.

Almost all of the individual cost items in processing have risen since 1972. Higher wage rates and higher packaging material prices have had the most impact since these items account for an important share of total processing costs. A substantial rise in packaging material prices has occurred since late 1973. Utility and fuel prices have risen even more sharply, but these items account for relatively less of total processing costs than wages and salaries and packaging.

Retail margins rose from 1972 to 1973. But those on eggs and broilers have come down from the levels reached in late 1973 and early 1974. For 1974, margins may average below those of 1973, but still above 1972. Retail margins on turkeys rose in 1973, especially following the upsurge in meat prices in late 1973. In 1974, these margins remained wide through the first three quarters. As a result, the average for 1974 will likely be above 1973, even though retailers follow their customary practice of reducing margins appreciably during the Thanksgiving and Christmas holiday periods.

Marketing costs, are likely to remain at least at present levels in 1975. There are few indications that input prices might moderate (labor, fuel, utilities, containers, vehicles, money, etc.). Furthermore, some increases are yet to be fully reflected (for example, utility rates and wage increases in warehousing and retail stores), and there is appparently no new technology ready for immediate introduction which would materially enhance productivity.

QUARTERLY PRODUCTION AND MARKETING COSTS FOR POULTRY AND EGGS

By
Verel W. Benson

ABSTRACT

Recent feed price fluctuations and increases in production costs have intensified the need for current poultry and egg production cost estimates. Quarterly production cost estimates were made based on monthly corn and soybean meal prices and on annual estimates of other production costs and marketing margins. These cost estimates tend to be indicative of the level and direction of changes in poultry and egg production costs.

KEYWORDS: eggs, broilers, turkeys, production, marketing, costs.

The feed price fluctuations of the past 2 years and the rapidly increasing input costs have increased the need for current production cost estimates. In response to this need, a cost estimating procedure developed during the operation of price controls was revised and computerized to provide a continuing set of quarterly production cost estimates. Although they are only preliminary estimates and do not exactly reflect the actual experience of individual producers, they are indicative of the level and direction of the changes in production costs.

Data are presently being collected across the country under cooperative agreement with the Georgia, Missouri, and Pennsylvania Agricultural Experiment Stations to use in devising continuing cost and returns series in greater depth and detail. These data will also materially improve the accuracy of present cost inputs and provide more precise estimates of the current net returns in the poultry industries.

The following tables present quarterly production and marketing cost estimates for broilers, eggs, and turkeys from 1972 to the present. The costs are estimated at the farm and wholesale levels. The farm level cost is the sum of the estimated feed cost per pound liveweight for broilers and turkeys and per dozen for eggs, and the estimated additional production costs such as chicks, medication, fuel and litter, labor, and overhead. A fixed annual marketing margin is added to the production cost per pound for ready-to-cook broilers and turkeys or per dozen eggs to arrive at a wholesale delivered cost. The farm to wholesale marketing margin is the sum of the estimated processing, shipping, and handling costs from the farm to the wholesale level. Production costs other than feed cost vary annually. These costs may overstate the costs for periods of peak seasonal production, i.e., spring egg production; however, they may also understate costs for low seasonal production levels. However, sufficient data are not presently available to estimate these cost differences more accurately.

Feed cost per ton is estimated as a function of the price of corn and soybean meal. Specified percentages of corn and soybean meal make up the rations for broilers, eggs, and turkeys. The monthly average Chicago corn and Decatur soybean meal prices were increased by a shipping cost differential and used as estimates of ingredient costs. In addition, ration costs were increased by 5 percent to account for the small quantities of more expensive ingredients which were added to balance the ration. Milling and distributing costs were also added to all rations.

The feed cost per pound liveweight for broilers and turkeys and per dozen eggs is presented separately since it shows the direct effect of feed ingredient costs on the cost of production. For example, the estimated effect of a 10 cent per bushel increase in the cost of corn on the feed cost is an increase of 0.28, 0.42, and 0.66 cents per pound for broilers and turkeys, and per dozen eggs, respectively. The estimated effect of

$10.00 per ton increase in the cost of 49 percent soybean meal on feed cost is an increase of 0.32, 0.44, and 0.42 cents per pound for broilers and turkeys and per dozen eggs, respectively. These approximate cost increases are based on the feed ration costs as estimated in this model and on feed conversion rates of 2.1 per pound for broilers, 3.1 per pound for turkeys, and 4.3 per dozen eggs.

Tables 1, 2, and 3 present the weighted average quarterly and annual cost, price, and net return estimates. Monthly estimates for broilers and turkeys were made and then weighted by federally inspected slaughter to obtain weighted quarterly and annual averages. Monthly egg estimates were weighted by total egg production less estimated eggs used for hatching. The feed prices used to determine the monthly feed cost per pound of broilers and turkeys and per dozen eggs were lagged 2 months for broilers, 3 months for turkeys, and 1 month for eggs. These lags were assumed to partially account for the lag between the purchase of feed ingredients and the sale of the final product.

The feed price lag and the quarterly averaging dampened the losses and potential losses during the price freeze of 1973. The post-price freeze and pre-price freeze profits offset any losses and the feed price lags matched the high corn and soybean meal costs with the high post-price freeze product prices.

The 1974 quarterly estimates indicate that all three commodities experienced losses in the spring and summer of 1974 with the loss per unit being the most extreme for the turkey industry. However, the broiler industry appears to have been in a net loss position since the post-price freeze pofits of the third quarter of 1973. In all, 1974 was a poor year for the poultry and egg industry. However, the turkey and egg industries were showing signs of improvement in the fourth quarter of 1974. The broiler industry profit-loss picture may also improve as the drop in feed ingredient costs of early 1975 is felt.

Table 1—Estimated production costs, total costs, and net returns for market eggs, 1972-74[1]

Period	Production costs		Total wholesale costs, cartoned Grade A large eggs[2] [3]	Wholesale Grade A large egg prices 14 metro areas[2]	Net returns[2] [3] [5]
	Feed[2]	Total[2]			
	Cents per dozen all eggs		*Cents per dozen Grade A large cartoned eggs*		
1972					
1st quarter	16.2	27.8	42.2	38.2	-4.0
2nd quarter	17.0	28.6	42.9	35.5	-7.4
3rd quarter	17.5	29.1	43.4	41.4	-2.1
4th quarter	18.6	30.2	44.6	47.1	2.5
Annual average	17.3	28.9	43.3	40.5	-2.8
1973					
1st quarter	23.7	36.2	52.6	56.7	4.1
2nd quarter	27.0	39.5	55.9	56.4	0.5
3rd quarter	37.6	50.1	66.5	73.0	6.6
4th quarter	28.7	41.2	57.6	71.3	13.7
Annual average	29.2	41.7	58.1	64.3	6.2
1974[4]					
1st quarter	31.2	45.6	63.6	72.3	8.6
2nd quarter	27.4	41.8	59.9	52.1	-7.8
3rd quarter	31.4	45.8	63.8	59.9	-3.9
4th quarter	34.1	48.5	66.6	68.1	1.6
Annual average	31.0	45.4	63.5	63.1	-0.4

[1] Based on secondary data and incomplete data from survey. Estimated by computerized formula. [2] Weighted by monthly egg production less estimated eggs used for hatching. [3] Based on farm cost converted to wholesale market values for Grade A large Eggs. [4] Preliminary. [5] May not add across due to rounding.

Table 2—Estimated production costs, total costs, and net returns for Broilers, 1972-74[1]

Period	Production costs		Total wholesale ready-to-cook costs[2 3]	9-city weighted average broiler price[2]	Net returns[2 3 5]
	Feed[2]	Total[2]			
	Cents per pound liveweight		*Cents per pound liveweight*		
1972					
1st quarter	8.3	13.6	27.2	27.8	0.6
2nd quarter	8.8	14.2	28.0	27.2	-0.7
3rd quarter	9.2	14.6	28.5	29.6	1.1
4th quarter	9.7	15.0	29.2	28.0	-1.2
Annual average	9.0	14.3	28.2	28.2	-0.1
1973					
1st quarter	12.2	18.0	34.0	37.0	3.0
2nd quarter	14.2	20.1	36.9	42.2	5.4
3rd quarter	21.2	27.0	46.5	52.8	6.3
4th quarter	17.6	23.4	41.5	37.2	-4.3
Annual average	16.4	22.2	39.8	42.4	2.6
1974[4]					
1st quarter	16.1	22.3	40.5	39.3	-1.2
2nd quarter	15.2	21.3	39.2	35.3	-3.9
3rd quarter	14.5	20.7	38.3	37.6	-0.7
4th quarter	17.7	23.8	42.6	40.4	-2.3
Annual average	15.8	22.0	40.1	38.0	-2.0

[1] Based on secondary data and incomplete data from survey. Estimated by computerized formula. [2] Weighted by monthly broiler slaughter. [3] Based on farm cost converted to wholesale market values for ready-to-cook broilers. [4] Preliminary. [5] May not add across due to rounding.

Table 3—Estimated production costs, total costs, and net returns for Turkeys, 1972-74[1]

Period	Production costs		Total wholesale ready-to-cook costs[2 3]	New York heavy young hen turkey price[2]	Net returns[2 3 5]
	Feed[2]	Total[2]			
	Cents per pound liveweight		*Cents per pound ready-to-cook*		
1972					
1st quarter	11.9	18.9	32.2	36.9	4.7
2nd quarter	12.9	19.9	33.3	34.8	1.4
3rd quarter	13.5	20.5	34.1	35.3	1.2
4th quarter	14.1	21.1	34.9	38.5	3.7
Annual average	13.5	20.5	34.1	36.6	2.8
1973					
1st quarter	15.4	22.9	37.8	45.1	7.3
2nd quarter	19.8	27.3	43.3	55.9	12.6
3rd quarter	27.0	34.5	52.3	69.2	16.9
4th quarter	28.2	35.7	53.8	67.2	13.4
Annnual average	25.6	33.1	50.6	64.5	13.9
1974[4]					
1st quarter	22.1	30.3	48.4	49.9	1.6
2nd quarter	23.6	31.8	50.2	39.2	-11.0
3rd quarter	19.9	28.1	45.6	45.6	-0.1
4th quarter	24.8	33.0	51.7	52.1	0.4
Annual average	22.5	30.7	48.8	47.0	-1.8

[1] Based on secondary data and incomplete data from survey. Estimated by computerized formula. [2] Weighted by monthly turkey slaughter. [3] Based on farm cost converted to wholesale market values for heavy young turkey hens. [4] Preliminary. [5] May not add across due to rounding.

BROILER PRODUCTION COSTS IN THE SOUTH AND NORTHEAST

By
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ABSTRACT: A survey of more than 200 farms and over 1,000 flocks shows many similarities in performance and some differences in individual cost items in producing broilers in the South and Northeast. From mid-1972 through 1974, costs averaged about 22.5 cents per pound of salable liveweight. Feed accounted for 72-74 percent of total costs, chicks for over 12 percent, and grower payment for 10-12 percent. Costs vary widely between months and within regions.

KEYWORDS: Broilers, production, costs, efficiency.

Costs of producing broilers have been higher and fluctuated more widely since the fall of 1972 than during the preceding 5 years. Most of the changes have been due to fluctuations in prices of major feed ingredients such as corn and soybean meal. However, other costs items have also trended upward since 1972.

Little comprehensive information has been available in recent years on total costs of producing broilers or on the relative importance of specific cost items. Table 1 summarizes some of the cost data being collected by the Georgia, Pennsylvania, and Missouri Agricultural Experiment Stations under cooperative agreements with the Economic Research Service. These data include costs from most of the major broiler producing regions of the United States. Flock records in the study covered a 2-year time period from the spring of 1972 to mid-1974.

Combined records for the two regions suggest that, with total costs of about 22.5 cents per pound of salable liveweight, feed accounted for 72-74 percent, chicks about 12.5 percent, grower payment for 10-12 percent, fuel for 1-2 percent, medication for 1-1.5 percent, litter for about 0.5 percent, and other costs for 0.5-1.0 percent. In the late 1960's when costs were under 15 cents per pound, feed accounted for over 62 percent, chicks 19 percent, grower payment 12 percent, fuel 2 percent, litter under 1 percent, medication and vaccines under 3 percent, and other costs for under 1 percent.

Direct comparison of the item-by-item costs in broiler production in table 1 in the two regions is difficult. Survey data did not cover the same proportions of flocks in each quarter of the total time period. Moreover, the nature of contract terms and the kinds and proportions of inputs furnished by contract growers and contractors vary within and between regions. While various kinds of production contracts exist in both regions, contractors in the Northeast, on the average, furnish higher proportions of the fuel and litter than those in the South. Fuel and litter allowances are often provided to growers in addition to the basic grower payment. The lower grower fixed costs in the Northeast are partially due to higher housing utilization.

Since these costs cover an extended time period, they are not representative of costs at present or in many past months. Costs of producing broilers in any area will vary from month to month, depending on feed ingredient prices, seasonality of fuel requirements for brooding, changes in measures of performance, and changes in factor prices. Using data from series on estimated U.S. costs of producing broilers (Poultry and Egg Situation November 1974 and March 1975) as a basis of comparison, costs in table 00 are about equal to these for late 1973 and early 1974. Costs in the U.S. series were 14.5 cents or under through mid-1972 and well above 25 cents by mid-1973. Recent levels are at or below 21 cents. Costs other than feed have widened from over 5 cents per pound in early 1972 to over 6 cents recently. Seasonal variation in brooding costs, while not large in cents per pound, could result from a range of 10 gallons of propane or less per 1,000 broilers in the summer to well over 60 gallons in the winter and a yearly average of 40-45 gallons.

Because of the time differences in the two area surveys, the table should not be used to conclude that

Table 1—Broiler Production Costs and Efficiency, Southern and Northeastern Regions, 1972-74[1]

Item	South[2]		Northeast[3]	
Sample characteristics:				
Farms (no.)	108		118	
Flocks sold (no.)	415		592	
Average liveweight (lbs. per bird)	3.77		3.96	
Feed conversion (lbs. feed per lb. broiler)	2.17		2.14	
Production Costs:	*Average*	*Range*[2]	*Average*	*Range*[3]
	(cents per pound, salable liveweight)			
Grower:				
Fuel	0.14	0.12-0.22	0.09[6]	0.01-0.40
Electricity	0.07	0.04-0.09	0.10	0.01-0.14
Litter	0.10	0.08-0.12	0.03	0.00-0.13
Hired labor	0.15	0.06-0.22	0.19[7]	0.11-0.28
Miscellanious	0.19[4]	0.08-0.30	0.02[8]	0.01-0.04
Total variable	0.65	---	0.43	---
Depreciation	0.43	0.39-0.60	0.43[9]	0.36-0.51
Interest	0.32	0.16-0.55	0.21	0.14-0.27
Insurance	0.08	0.04-0.10	0.08	0.04-0.15
Repairs, maintenance	0.11	0.06-0.19	0.15	0.11-0.17
Taxes	0.05	0.03-0.07	0.09	0.05-0.15
Total fixed	0.99	---	0.96	---
Total grower:	1.64	---	1.39	---
Contractor:				
Feed	16.65	16.05-17.23	16.25	15.33-16.66
Chicks	2.80	2.65-3.08	2.77	2.47-3.24
Grower payment	2.30	2.19-2.43	2.63	2.24-3.30
Medication and vaccination	0.24	0.14-0.50	0.34[10]	0.13-0.53
Fuel	0.14	0.07-0.22	0.32	0.19-0.45
Litter	0.02	0.01-0.03	0.10	0.00-0.21
Other	0.32[5]	0.23-0.43	0.11[11]	0.00-0.27
Total contractor	22.47	21.34-23.92	22.52	21.62-23.39

[1] Data collected in the South by Georgia Agr. Exp. Sta., in Northeast by Pennsylvania Agr. Exp. Sta. under cooperative agreements with Econ. Res. Ser., U.S. Department of Agriculture. Records from mid-1972 to mid-1974. [2] Includes Alabama, Georgia, North Carolina, Arkansas, Texas, Mississippi. Ranges by cost item from individual State averages. [3] Includes Pennsylvania, Maine, Delaware, Maryland, Virginia. Ranges by cost item from individual State averages. [4] Includes waste disposal, water, dues, and other costs. [5] Includes administration, field supervision, insurance, and miscellaneous. Not all cost items included. [6] Includes fuel use for manure and other waste disposal and fuel for heat. See also[7]. [7] Unadjusted for payments in kind frequently associated with manure disposal. [8] Includes sanitation, dues, and other miscellaneous costs. [9] Includes rent. [10] Includes services for sexing, debeaking. [11] Includes sanitation, electricity, dues and other miscellaneous costs. May not completely include some small items.

Northeastern costs are necessarily equal to those in the South. There is also wide variation between flocks in both regions. However, grower payments in broiler production do tend to average higher in Northeast than in the South. This is a function of the extent of competition for growers versus other economic alternatives in various areas, distances of producing areas from the major markets which influence shipping costs, and price premiums obtained for some northeastern broilers over southern birds due to heavier weights, differences in packs, and types of outlets serviced.

The relative shares of fixed and variable costs borne by growers and contractors were not determined by this survey. However, contractors would, of course, incur substantial fixed costs in operating feed mills and hatcheries as part of an integrated organization, plus smaller fixed cost increments under other operations. Although not a fixed cost in an accounting sense, most production contracts specify a minimum rate of payment to contract growers which must be met.

On the basis of the date in the table, grower fixed costs of just under 1 cent per pound would represent 60-70 percent of itemized grower costs and 35-45 percent of grower payment (which includes return to operator labor and management). Estimates made using data from the table and fixed cost percentages from other studies suggest contractor fixed costs (in an integrated organization) of over 1 cent per pound, and over 5 percent of total contractor costs. If a minimum grower payment were added to the

preceding fixed costs, the resulting figure of over 3 cents per pound would range from 14 to well over 15 percent of total contractor costs. Even with somewhat different figures, it seems apparent that grower fixed costs constitute a substantially higher percentage of total grower costs than contractor fixed costs do of total contractor costs. On the other hand, the absolute amount of fixed costs incurred by contractors probably exceeds grower fixed costs.

Data in the survey indicate similar feed conversions existed in the South and Northeast, and higher liveweights in the Northeast. Fuel costs averaged higher in the Northeast than in the South, mainly due to climatic differences.

COMMERCIAL EGG PRODUCTION COSTS IN FOUR REGIONS, 1973-74.

By
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ABSTRACT: Records from 243 farms in major producing areas of the United States indicate for 1973-74 costs averaged about 41.4 cents per dozen. Some regional differences exist in production costs and practices in producing market eggs. Contract and independent producer's costs within each region averaged about the same. Feed accounted for almost 69 percent of total costs, replacement pullet costs for almost 20 percent, and overhead costs for over 6 percent.

KEYWORDS: Eggs, production, costs, efficiency.

Costs of producing market eggs averaged as much as 50 percent higher in 1973-75 than in the preceding 5 years. Most of this increase resulted from substantial increases in feed ingredient costs, although many other variable and fixed costs also rose. Because feed prices were generally higher in 1974, egg production costs were higher than in either 1973 or 1975.

Egg production costs vary as much as 3 cents per dozen between major producing regions. They tend to be highest in the Northeast and on the Pacific Coast and lower in the South and Midwest. Costs also vary widely within each region, depending on flock size, efficiency, and feed ingredients, milling, and distribution costs. Table 1 compares cost data collected by the Georgia, Missouri, and Pennsylvania Agricultural Experiment Stations under cooperative agreements with the Economic Research Service plus preliminary estimates for California.

Records from the four regions show that total costs, not including operator labor and return to management, were 41.4 cents per dozen in the 2-year period, 1973-74. Feed accounted for nearly 69 percent of total costs, replacement pullet costs for almost 20 percent, overhead costs for over 6 percent, and hired labor, utilities, and miscellaneous costs for 5 percent. Prior to 1973, feed costs accounted for a somewhat smaller percent of total costs.

For the sample farms in the study, feed prices per ton averaged highest in the Northeast—over $20 per ton higher than in California and $10 or more per ton higher than in the Midwest and South. Records indicate that feed prices tend to be lower with large integrated complexes—due to volume of feed—than with many smaller independent flocks or with contract flocks. Feed prices in some areas (especially the Northeast) charged to contract production also typically include charges for other inputs, such as medication. Regional differences in feed prices were generally reflected in feed costs per dozen in the Northeast, South, and Midwest with the amount of feed used per dozen eggs close to 4.2 pounds in all three regions. In California, where feed use per dozen was about 4.7 pounds per dozen due to the larger proportion of older flocks with force molted birds, the higher rate of feed use offset the lower feed price. Rate of lay averaged higher in the Northeast, South, and Midwest where all-pullet flocks predominated. Laying house mortality in the sample flocks appeared lower in the Northeast and Midwest.

Laying flocks in the Midwest averaged only three-fourths as large as those in the Northeast and South and less than a third as large as those in California. In California, hired labor appears to be a much larger cost item than elsewhere because of the large mechanized operations where hired labor is extensively substituted for family labor. Variations in record-keeping systems and differences in size and types of farms make direct comparisons difficult on many other items. Costs of cases and packing materials were excluded from Table 1 costs to standardize them on a nest-run basis. Although there is considerable variation in

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actual practices, packaging costs ranged from 2-3 cents per dozen for those farms that provided these items.

In the Northeast and South, costs were calculated separately for contract and independent flocks. Independent flocks were generally larger, and they averaged more than twice as large as typical contract flocks in the Northeast and about three times larger in the South. Many independent flocks are part of vertically integrated firms which have lower costs per dozen eggs for feed and pullets and higher costs for hired labor, utilities, and overhead. However, total production costs for contract and independent producers within each region were nearly the same, although costs were substantially lower in the South (Table 2).

Since November 1974, estimaed U.S. costs of producing market eggs have been carried in the Poultry and Egg Situation. The 1973-74 average of these costs was 43.6 cents per dozen, which was very close to the 44.4 cents per dozen average for total contract costs reported in the samples for the Northeast and South.

Feed prices for egg producers dropped substantially after late 1974 and early 1975. The decline in price per ton reduced feed costs about 4 cents per dozen. Other costs have continued to increase, however, and grower payments in many areas may have increased also, some as much as ½ cent per dozen. Producers generally showed a positive net return to labor and management in 1973, but due to sharp increases in feed prices, they showed a negative return in 1974. With market prices for eggs in 1975 averaging only slightly lower, but with feed prices down substantially from 1974, producer net returns again became positive in 1975.

Table 1—Commercial Egg Production Costs and Efficiency, Four Regions, 1973-74

Item	Northeast	South	Midwest	California[1]
Sample characteristics:				
Farms (no.)	67	103	51	22
Layers per farm (1,000)	24.2	28.2	19.2	60
Eggs sold per fm (1,000 cs.)	15.1	17.9	12.2	37.8
Rate of lay (% H.H.)	62.6	63.5	62.5	62.0
Feed conversion (lbs./doz.)	4.18	4.24	4.18	4.70
Mortality (%)	10.7	15.1	12.9	16
Costs, cents per dozen				
Feed	30.17	27.56	28.00	28.25
Replacement pullets	8.97	8.15	8.33	7.25
Hired labor	.47	.92	.80	2.15
Utilities	.70	.28	.55	.50
Other variable	.27	.69	.37	.40
Total variable costs	40.58	37.60	38.05	38.55
Depreciation	1.13	1.18	1.55	1.20
Repairs, maintenance	.20	.28	.20	.20
Taxes, interest	.80	.94	.88	1.40
Insurance	.17	.14	.18	.20
Total fixed costs	2.30	2.54	2.81	3.00
Total costs[2]	42.88	40.14	40.86	41.55

[1] Interpolated mainly from San Diego County record summaries. Cost categories adjusted based on other area records. [2] Not including operator labor, return to management, packaging, assembly and delivery operations.

Table 2—Egg Production Costs of Contract and Independent Flocks in the Northeast and South and United States average, 1973-74

Item	Northeast		South		ERS national-level series
	Contract flocks	Independent flocks	Contract flocks	Independent flocks	
	(Cents per dozen eggs)	*(Cents per dozen eggs)*	*(Cents per dozen eggs)*	*(Cents per dozen eggs)*	*(Cents per dozen eggs)*
Feed cost	31.03	29.73	27.90	26.61	---
Other costs	11.97	13.10	12.64	14.14	---
Total costs[1]	43.00	42.83	40.54	40.75	---
Feed costs	---	---	---	---	30.15
Contractor costs	40.50	---	36.69	---	---
Grower payment	6.47	---	5.20	---	---
Other costs	---	---	---	---	12.45
Total costs[2]	46.97	---	41.89	---	43.60

[1] Not including operator labor and return to management. [2] Including operator labor and return to management, or contract grower payment.

TURKEY PRODUCTION COSTS IN MAJOR REGIONS, 1973-75

By
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Harold B. Jones[2], and William L. Henson[2]

ABSTRACT: Records from farms raising more than 19 million turkeys in major producing areas indicate 1973-75 costs averaged about 31.8 cents per pound liveweight for heavy young turkeys. Costs were lowest in the Midwest and South and highest in California and the Northeast. Feed accounted for almost 75 percent of total costs, poults for 11 percent, other variable costs for over 7 percent, and overhead costs for almost 7 percent.

KEYWORDS: Turkeys, production, costs, efficiency.

Costs of producing heavy young turkeys averaged about 55 percent higher in 1973-75 than in the preceding 5 years. Most of this increase resulted from substantial increases in feed ingredient costs, although many other variable and fixed costs also rose. Costs were higher in 1973 than in 1974 and 1975 because of peak feed prices.

Turkey production costs vary as much as 4 cents per pound between major producing regions. They tend to be highest in California and lowest in the Midwest and South. Although costs in the Northeast are not reported in this article, they are likely to be above those in other regions. Costs in the Mountain region are between those in the Midwest and in California.

Costs also vary widely within regions, depending on flock size, efficiency, and feed ingredient, milling, and distribution costs. Table 1 compares cost data collected by the Missouri, Georgia, and Pennsylvania Agricultural Experiment Stations under cooperative agreements with the Economic Research Service.

Records from the major regions show that total costs, not including operator labor and return to management, were 31.8 cents per pound for heavy young turkeys in 1973-75. Feed accounted for 74.6 percent of total costs, poults for 11.2 percent, other variable costs for 7.4 percent, and overhead costs for 6.8 percent (table 1). Prior to 1973, feed costs accounted for about two-thirds of total costs.

Table 1—Production costs for heavy young turkeys[1] in three major regions, 1973-75

Item	Midwest	South	California
Sample characteristics:			
Number of head (mil.)	6.4	4.7	8.0
Feed conversion (lbs. feed per lb. turkey)	3.06	3.10	3.04
Feed price (dollars per ton)	143.60	148.13	169.71
Mortality (percent)	10.5	11.7	9.2
Average live weight (lbs.)	20.1	18.1	20.6
	(cents per pound, live weight)		
Production costs:			
Feed	22.00	23.01	25.80
Poult	3.45	3.69	3.53
Medication	.34	.36	.33
Fuel	.64	[5].38	.41
Other[2]	1.50	[5]1.13	1.88
Total variable	27.93	28.57	31.95
Total fixed[3]	2.33	[5]1.40	2.35
Total costs[4]	30.26	[5]29.97	34.30

[1] Hens and toms combined. [2] Includes hired labor, electricity, water, litter, waste disposal, operating capital interest, and miscellaneous cash costs. [3] Includes depreciation, rent, interest, insurance, taxes. [4] Do not include return to operator's labor and management. [5] Adjusted to reflect some year round confinement operations. Range operations alone totalled 29.11 cents.

Feed prices averaged lowest in the Midwest—closest to the sources of many feed ingredients—and highest in California and the Northeast. Feed prices in the South were about $5 per ton higher than those in the Midwest, and in the Mountain region over $10 per ton higher. Feed conversions in all regions averaged from slightly under to slightly over 3.10 pounds of feed per

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pound of live turkey. Mortality averaged 9 to 12 percent, and liveweight for heavy young turkeys was 18-21 pounds.

Costs per pound for producing fryer-roaster turkeys (8-10 pounds liveweight) may average 1.5 to 3.5 cents per pound higher than costs for producing heavy young turkeys, depending on location and unit sizes—especially with near year-round output. Feed conversions on fryer-roaster sizes are likely to average close to 2.7 pounds of feed per pound of live turkey. Hence, feed costs per pound in producing fryer-roaster turkeys are lower, while poult, some other variable, and fixed costs per pound are higher.

Costs per pound for producing heavy young hen turkeys may run from about the same to a few cents higher than for heavy young tom turkeys. Mortality is lower with hens and feed conversion often better, although the average price per ton for feed may be slightly higher for hens. Hence, feed cost per pound may be similar to lower for hens than for toms. Such per pound costs as poults, medication, fuel, and labor may be higher with hens, while condemnation, litter, and most overhead costs are higher with toms.

Confinement rearing of turkeys costs more than range rearing, particularly since confinement rearing involves more cold weather brooding. Fuel costs thus average higher with confinement operations as may electricity costs for ventilation during the summer months. In addition, costs for overhead items are higher with confinement operations, but costs for labor and motor fuels can be higher with range operations. Year-round confinement production costs may average as much as 3 cents above seasonal range production costs in the northernmost States to less than 1.5 cents more in the South. Confinement rearing has been increasing and has some advantages from the standpoints of fuller use of input-supplying and processing facilities and the expansion of year-round marketings.

A large proportion of the Nation's turkeys are produced under contracts where the bulk of the variable cost inputs are furnished by the contractor. These inputs are: feed, poults, medication, flock insurance, and some energy and miscellaneous items. Contract growers furnish the remainder of variable cost items plus labor and fixed cost items in return for contract payments. Total contract growing costs may often be slightly higher than costs of independent growers—which do not typically show the return for operator's labor and management.

Contract grower payments in this study rose substantially in California from 1973 to 1975, at a somewhat lower rate in the South, and very little in the Midwest. For the 1973-75 period, payment rates averaged highest in California and lowest in the South. Contract grower payments were about 11 percent of total contract growing costs in the three regions in 1973-75 (table 2).

Table 2—Contract production costs for heavy young turkeys in three major regions, 1973-75

Item	Midwest	South	California
	(cents per pound, live weight)		
Contractor variable costs	27.00	27.21	30.70
Grower payment	3.55	3.25	3.85
Total contractor costs	30.55	30.46	34.55

COSTS AND RETURNS FOR POULTRY AND EGGS, 1955-75

By
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ABSTRACT: Net returns from egg, broiler, and turkey production, whether measured at the farm or wholesale market level, vary substantially from year to year. Variations reflect not only the response of producers to past results and expected prices, but also demand and production cost-related forces. These series provide historical comparisons with quarterly estimates from 1972 to date previously published in the *Poultry and Egg Situation*.

Both feed and other costs of producing market eggs, broilers, and turkeys trended downward from the mid-1950's to the mid-1960's. The development of larger producing units resulted in some economies of scale in production. Feed conversion ratios (pounds of feed per dozen eggs or per pound of broiler or turkey) declined substantially. Egg output per layer rose, and the ages to market weight were reduced. Many of these forces continued into the 1970's.

Over the same period, efficiencies in marketing, including realization of economies of scale in processing, more direct marketing channels, and increased densities in supply areas, resulted in a downward trend in marketing costs.

In recent years, higher feed prices and increased

Table 1—Commercial market eggs: Annual production and marketing costs and prices and net returns at the farm and market levels, 1955-75

Year	Production costs[1]			Farm prices[2]	Net returns	Market cost[3]	Market price[4]	Net returns
	Feed	Other	Total[1]					
	(cents per dozen, all eggs)					(cents per dozen, Grade A large, cartoned)		
1955	20.5	11.5	32.0	34.0	+2.0	48.5	50.9	+2.4
1956	19.6	11.7	31.3	33.9	+2.6	47.6	50.4	+2.8
1957	18.5	11.7	30.2	31.8	+1.6	46.0	47.0	+1.0
1958	18.6	10.8	29.4	33.8	+4.4	45.1	49.3	+4.2
1959	18.3	11.9	30.2	26.4	-3.8	45.6	41.1	-4.5
1960	17.5	10.8	28.3	32.2	+3.9	43.2	46.6	+4.2
1961	18.0	11.0	29.0	30.3	+1.3	43.9	45.3	+1.4
1962	18.0	10.6	28.6	27.2	-1.4	43.3	41.5	-1.8
1963	18.2	10.2	28.4	28.6	+0.2	42.5	42.4	-0.1
1964	17.5	10.2	27.7	27.8	+0.1	41.5	41.7	+0.2
1965	17.3	10.4	27.4	26.2	-1.2	40.6	40.5	-0.1
1966	18.2	10.0	28.2	33.8	+5.6	41.6	47.2	+5.6
1967	17.0	10.7	27.7	22.7	-5.0	41.1	37.1	-4.0
1968	16.2	10.8	27.0	27.7	+0.7	40.4	40.7	+0.3
1969	16.0	10.6	26.6	35.5	+8.9	40.4	49.8	+9.5
1970	16.7	11.6	28.3	31.5	+3.2	43.0	47.3	+4.3
1971	16.5	12.0	28.5	23.5	-5.0	43.2	39.5	-3.7
1972	17.3	11.6	28.9	24.6	-4.3	43.3	40.5	-2.8
1973	29.2	12.5	41.7	28.4	+6.7	58.1	64.3	+6.2
1974	31.0	14.4	45.4	45.2	-0.2	63.4	63.0	-0.4
1975	29.0	14.5	43.5	44.6	+1.1	61.8	62.9	+1.1

[1] Commercial production estimates develop from previous study for all production, commercial and non-commercial, 1955-71. Calculated by computerized formula monthly beginning in 1972, using studies and surveys. [2] Derived from ERS prices spreads series, 1955-66, and from New York wholesale prices, 1967-75. [3] Includes assembly, packing and cartoning, long-distance hauling, grade loss, etc. [4] Calculated from Bureau of Labor Statistics retail prices, less retailing and distributing margins, 1955-71. Prices of cartoned eggs to volume buyers in major markets, 1972-75.

prices for other inputs in production and marketing have raised costs per unit of output in both production and marketing. These have sometimes been more than offset by inflationary price increases.

However, net returns from egg and poultry production—either at the farm or market level—show many year-to-year variations. These pluses (profits) and minuses (losses) tend to average out over a period of years, but their existence points up the variability of producer incomes. Many of these variations result from forces which it is difficult for the individual producer to anticipate or offset.

Table 2—Commercial broilers: Annual production and marketing costs and prices and net returns at the farm and market levels, 1955-75

Year	Production costs[1]			U.S. farm price[2]	Net returns	Plant costs[3]	Market cost[4]	Wholesale market price[5]	Net returns
	Feed	Other	Total						
	(cents per pound, live weight)					(cents per pound, ready-to-cook weight)			
1955	13.1	7.4	20.5	25.2	+4.7	27.9	35.7	41.5	+5.2
1956	12.3	6.7	19.0	19.6	+0.6	26.4	34.0	34.7	+0.7
1957	11.9	6.3	18.2	18.9	+0.7	25.3	32.6	33.0	+0.4
1958	11.6	6.0	17.6	18.5	+0.9	24.4	31.4	32.1	+0.7
1959	11.0	5.7	16.7	16.1	-0.6	23.2	30.1	29.0	-0.9
1960	10.3	5.4	15.7	16.9	+1.2	21.8	28.4	29.9	+1.5
1961	10.0	5.1	15.1	13.9	-1.2	21.0	27.4	26.1	-1.3
1962	9.9	4.9	14.8	15.2	+0.4	20.6	26.8	28.0	+1.2
1963	10.1	4.7	14.8	14.6	-0.2	20.6	26.6	27.2	+0.6
1964	10.0	4.5	14.5	14.2	-0.3	20.1	26.0	25.4	-0.6
1965	9.8	4.7	14.5	15.0	+0.5	20.1	26.3	26.4	+0.1
1966	9.8	4.9	14.7	15.3	+0.6	20.4	26.8	27.6	+0.8
1967	9.1	5.0	14.1	13.3	-0.8	19.7	26.2	25.2	-1.0
1968	8.4	5.1	13.5	14.2	+0.7	18.8	25.7	27.2	+1.5
1969	8.5	5.3	13.8	15.2	+1.4	19.2	26.5	29.1	+2.6
1970	8.8	5.4	14.2	13.5	-0.7	19.7	27.1	26.4	-0.7
1971	9.0	5.3	14.3	13.8	-0.5	19.9	27.6	27.2	-0.4
1972	9.0	5.3	14.3	14.3	0.0	19.9	28.2	28.2	0.0
1973	16.4	5.8	22.2	24.2	+2.0	30.8	39.8	42.4	+2.6
1974	15.8	6.2	22.0	21.7	-0.3	30.1	40.1	38.0	-2.1
1975	15.1	6.2	21.3	26.4	+5.1	29.2	39.5	45.2	+5.7

[1] Estimated from various studies, 1955-66. Calculated by computerized formula monthly beginning 1967, using studies and surveys. [2] SRS series. [3] Live cost converted to ready- to-cook weight. [4] Includes assembly, processing, long-distance hauling. [5] Based mainly on New York wholesale price, 1955-63. Based on 9 city weighted average wholesale price beginning with 1964.

Table 3—Commercial turkeys: Annual production and marketing costs and prices and net returns at the farm and market levels, 1955-75

Year	Production costs[1]			U.S. farm price[2]	Net returns	Plant costs[3]	Market cost[4]	Wholesale market price[5]	Net returns
	Feed	Other	Total						
	(cents per pound, live weight)					(cents per pound, ready-to-cook weight)			
1955	20.0	7.0	27.0	30.2	+3.2	33.8	42.6	47.9	+5.3
1956	19.1	6.7	25.8	27.2	+1.4	32.3	40.9	45.0	+4.1
1957	18.3	6.3	24.6	23.4	-1.2	30.8	39.1	39.0	-0.1
1958	17.8	6.1	23.9	23.9	0.0	29.9	38.2	42.5	+4.3
1959	17.0	5.9	23.9	23.9	0.0	29.9	37.8	37.6	-0.2
1960	15.6	5.8	21.4	25.4	+4.0	26.8	34.4	43.5	+9.1
1961	15.2	5.7	20.9	18.9	-2.0	26.1	35.8	35.6	-0.2
1962	15.0	5.9	20.9	21.6	+0.7	26.1	33.7	34.8	+1.1
1963	15.1	6.0	21.1	22.3	+1.2	26.4	33.8	36.5	+2.7
1964	14.6	6.2	20.8	21.0	+0.2	26.0	33.1	33.6	+0.5
1965	14.4	6.4	20.8	22.2	+1.4	26.0	32.9	37.0	+4.1
1966	14.7	6.5	21.2	23.1	+1.9	26.5	34.4	38.0	+3.6
1967	14.3	6.6	20.9	19.6	-1.3	26.1	35.5	33.5	-2.0
1968	13.2	6.6	19.8	20.5	+0.7	24.8	32.9	32.4	-0.5
1969	13.5	6.7	20.2	22.4	+2.2	25.3	33.5	36.3	+2.8
1970	14.0	6.8	20.8	22.6	+1.8	26.0	34.3	40.9	+6.6
1971	13.3	6.9	20.2	22.1	+1.9	25.3	33.7	37.5	+3.8
1972	13.5	7.0	20.5	22.2	+1.7	25.6	34.1	36.6	+2.5
1973	25.6	7.5	33.1	34.8	+1.7	41.4	50.6	64.5	+13.9
1974	22.5	8.2	30.7	28.8	-1.9	38.4	48.9	47.0	-1.9
1975	22.1	8.6	30.7	33.2	+2.5	38.4	49.4	55.1	+5.6

[1] Estimated from various studies, 1955-71. Calculated by computerized formula monthly beginning in 1972, using studies and survey. [2] SRS series. [3] Live cost converted to ready-to-cook weight. [4] Includes assembly, processing, long-distance hauling. [5] Estimated from Chicago and New York wholesale prices for 12-14 and 8-16 pound frozen heavy young hens, 1955-62. New York wholesale price, 1963-75.

SHELL EGG PACKING AND BROILER PROCESSING COSTS IN MAJOR REGIONS

by
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and Leonard A. Voss[2]

ABSTRACT: Records from 97 egg packing plants indicate average packing costs per dozen of almost 7.75 cents in 1974-76, with almost a cent for fixed costs and the balance for variable costs. Additional costs incurred by plants for product assembly and distribution ranged from 1.6 to over 3 cents per dozen. For 33 broiler processing plants, costs per pound of processing ready-to-cook broilers averaged 7.36 cents during 1973-75, with from under 1 cent up to 1.5 cents for fixed costs and the balance for variable costs. Additional costs of 1.8 to 2.7 cents were incurred for broiler assembly and distribution.

KEYWORDS: Eggs, broilers, processing, assembly, distribution, costs.

Costs for assembly, packing, processing, and distributing functions performed by shell egg packing plants and broiler processing plants account for more than 40 percent of farm-to-retail price spreads. These costs have risen more than a third over the past 5 years due to sharply higher costs for packaging materials and energy nd smaller increases in costs for labor and other inputs.

Egg Packing

Records for 1974-76 from 97 egg packing plants in four major egg producing regions showed total costs averaging about 10.25 cents per dozen for the aggregate of eggs sold both in cartoned and loose packs (table 1). About 7.75 cents was for inplant costs. Of the inplant costs, less than a half were for packaging materials—including cartons, cases, filler flats—about a third for wages and salaries, and about 12 percent for overhead costs. Inplant costs averaged lowest on the West Coast and highest in the Northeast.

Of the 2.5 cents for assembly and distribution costs, over 0.8 cent was for moving eggs from farms to packing plants and the balance was both for long-distance hauling to and distributing within consuming markets. Assembly and distributing costs vary considerably from firm to firm within regions. Some packing plants are located

Table 1—Shell egg packing plant costs,[1] major regions, 1974-76

Item	South 1974-75	Northeast 1974	Midwest 1974	West Coast 1974-76
No. of plants	16	37	26	18
Volume (mil. cs.)	4.6	10.6	4.7	8.3
Product form:				
% cartoned	79	67	75	75
% loose	21	33	25	25
	(cents per dozen)			
Variable costs:				
Plant labor	1.91	1.91	1.95	1.97
Packaging	3.69	3.88	3.75	3.70
Utilities, fuel	.19	.37	.23	.20
Management, office	.56	1.10	.51	.37
Miscellaneous	.16	.36	.19	.21
Total	6.51	7.62	6.63	6.45
Fixed costs:				
Depreciation, rent	.43	.54	.41	.45
Repairs, maintenance	.16	.08	.20	.10
Taxes, interest, insurance	.37	.36	.35	.33
Total	.96	.98	.96	.88
Total inplant costs	7.47	8.60	7.59	7.33
Assembly costs	.51	.72	1.10	.94
Distribution costs	1.75	.88	1.76	2.42
Total all costs	9.73	10.20	10.45	10.69

[1] For cartoned and loose eggs combined. Costs reflect physical and quality losses in performing marketing functions.

Source: Data collected under cooperative agreements between the Georgia, Missouri, and Pennsylvania Agricultural Experiment Stations and the Economic Research Service.

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[2] University of Missouri, Columbia.

adjacent to production operations and have negligible costs for assembly, while others obtain supplies from over a large area. Some firms deliver larger proportions of their output to retail stores and warehouses than do others. Distribution costs for regions do, however, also tend to reflect distances to major markets.

The 97 egg packig plants were generally large in size and accounted for over 16 percent of the eggs destined for domestic consumption. Some also operated-egg breaking plants. Of the volume sold by the sample plants, about three-fourths was in cartons and the balance packed loose in cases.

In recent years, an important yardstick in the pricemaking process has been the costs of packing Grade A large eggs in cartons from the No. 1 Nest Run grade. Three surveys of inplant costs of various sizes of firms made between late 1974 and early 1976 showed average costs of 11.68 cents per dozen. Of this average, 4.02 cents was for net cost of materials, 4.82 cents for plant operating and overhead costs, and 2.84 cents per dozen for grade and size loss. Total costs averaged 12.5 cents in the Northeast, 11.3 cents in the Midwest, and 11.5 cents in the South.

Broiler Processing

Records for 1973-75 from 33 broiler processing plants in three major regions showed total costs averaging almost 9.70 cents per pound, ready-to-cook weight (table 2). About 7.36 cents was for inplant costs. Of the inplant costs, almost 58 percent was for wages and salaries, over 17 percent for packaging materials, and over 15 percent for overhead costs. Inplant costs averaged lowest in the South and highest on the West Coast.

Of the 2.3 cents for assembly and distribution costs, 1.0 cent was for loading and hauling live broilers from farms to plants. The balance was both for long-distance hauling of ready-to-cook products and distributing within consuming markets. Assembly costs were similar in various regions because most broiler processing plants obtain birds from supply areas of limited radius. On the other hand, distribution costs may vary widely within and among regions due both to distances to major markets and relative proportions of output delivered to rtail stores and warehouses.

The commercial broiler processing plants were about average in size and accounted for about 17 percent of total slaughter. Some plants also had further-processing operations in addition to slaughtering, eviscerating, and cutting-up lines. For the plants in the sample, further processing accounted for only 3-4 percent of volume, compared with almost 62 percent sold in ready-to-cook whole form and over 34 percent in cut-up form.

Table 2—Broiler processing plant costs,[1] major regions, 1973-75

Item	South 1973-74	North-east 1974	West Coast 1973-75
No. of plants	16	11	6
Volume (mil. lbs. RTC)	732	326	232
Product form:			
% whole	70	60	55
% cut-up	26	34	44
% further-processed	4	6	1
	(cents per pound, RTC wt.)		
Variable costs:			
Plant labor	3.25	3.97	3.87
Packaging	1.10	1.44	1.28
Utilities, fuel	.34	.56	.41
Management, office	.52	.49	.59
Miscellaneous	.21	.30	.37
Total	5.42	6.76	6.52
Fixed costs:			
Depreciation, rent	.33	.30	.87
Repairs, maintenance	.35	.20	.36
Taxes, interest, insurance	.34	.31	.32
Total	1.02	.81	1.55
Total inplant costs	6.44	7.57	8.07
Assembly costs	1.04	.96	1.00
Distribution costs	1.45	.86	1.70
Total all costs	8.93	9.39	10.77

[1] Costs below do not include further-processing operations. Costs reflect condemnation and physical losses.

Source: Data collected under cooperative agreements between the Georgia, Missouri, and Pennsylvania Agricultural Experiment Stations and the Economic Research Service.

COSTS OF TURKEY AND FOWL PROCESSING AND EGG BREAKING IN MAJOR REGIONS

by
George B. Rogers[1], Leonard A. Voss[2],
Harold B. Jones[1], and William L. Henson[1]

ABSTRACT: Records from 16 turkey processing plants indicated average packing costs per pound of ready-to-cook young heavy turkeys of almost 7.3 cents in 1973-1975, with fixed costs averaging about 1.5 cents and the balance variable costs. Additional costs incurred by plants for product assembly and distribution were about 2.8 cents per pound. For 13 processing plants, costs of processing ready-to-cook fowl averaged about 7.6 cents during 1973-74, with fixed costs averaging over 1.6 cents. Additional costs averaging about 2.9 cents were incurred for fowl assembly and distribution.

Based on records from 18 egg breaking plants and secondary data, average breaking costs per pound of liquid egg equivalent averaged almost 6.2 cents in 1973-75, with almost 1.4 cents for fixed costs. Additional costs for assembly and distribution averaged 2.3 cents per pound.

KEYWORDS: Turkeys, fowl, egg breaking, processing, assembly, distribution, costs, marketing.

Little comprehensive information has been available in recent years on the costs of processing turkeys and fowl and of egg breaking. Data on such operations, plus the associated plant assembly and distributing operations, were collected under cooperative agreements between the Missouri, Georgia, and Pennsylvania Agricultural Experiment Stations and the Economic Research Service. Current costs are likely somewhat higher than those summarized in tables 1-3 because of sharply higher costs for packaging and energy and smaller increases for labor and other inputs.

Turkey Processing

Records for 1973-75 from 16 turkey processing plants in three major regions showed total costs averaging almost 10.1 cents per pound of ready-to-cook heavy young turkey (table 1). About 7.3 cents were for inplant costs. Of the inplant costs, about 43 percent was for wages and salaries, almost 24 percent for packaging materials, about 13 percent

Table 1—Turkey processing plant costs, major regions, 1973-75

Item	Heavy young turkeys[1]	
	Midwest So. 1973-74	West 1973-75
	(Cents per lb., RTC wt.)	
Wages, salaries, fringe benefits	2.73	3.56
Packaging, supplies	1.57	1.89
Utilities, ice, freezing, storage, misc.	.88	1.05
Total plant operating costs	5.18	6.50
Total plant overhead costs[2]	1.24	1.64
Total plant costs[3]	6.42	8.14
Total assembly costs	.95	.97
Total distribution costs[4]	2.02	1.66
Total all costs	9.39	10.77
Number of plants covered by cost data	9	7
Volume (mil. lbs. RTC)[5]	239	159

[1] Hens and toms combined. Costs do not include further-processing operations. [2] Depreciation, repairs and maintenance, rent, taxes, interest, insurance on buildings and equipment. [3] Plant costs on fryer-roaster turkeys were about 2 cents per pound higher than on heavy young turkeys. [4] Reflects local distribution costs plus some long-distance hauling. [5] Per year.

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[2] University of Missouri, Columbia.

utilities and miscellaneous, and almost 20 percent for overhead costs. Inplant costs averaged highest on the West Coast.

Of the 2.8 cents for assembly and distribution costs, less than a penny was for loading and hauling live turkeys from farms to plants. The balance was both for distributing within consuming markets and long-distance hauling of ready-to-cook products.

The turkey processing plants accounted for about 15 percent of the plants which slaughter predominantly turkeys, and almost 22 percent of the volume. For the sample plants, about 80 percent of the output was frozen, almost 9 percent ice-packed and over 11 percent deep-chill, etc. Whole ready-to-cook birds accounted for almost 62 percent, cut-up for 13 percent, and the balance of over 25 percent was further-processed by the same plants. Over 50 percent was sold to retailers, 14 percent to distributors, almost 7 percent to institutions, over 2 percent was exported, and the remainder of nearly 27 percent was used directly by further-processing plants.

Fowl Processing

Records for 1973-74 from 13 fowl processing plants in three major regions showed total costs averaging about 10.5 cents per pound of ready-to-cook fowl (table 2). About 7.6 cents were for inplant costs. Of the inplant costs, almost 57 percent was for wages and salaries, almost 14 percent for packaging materials, over 8 percent for utilities and miscellaneous, and over 21 percent for overhead costs. Inplant costs averaged highest on the West Coast.

Table 2—Fowl processing plant costs, major regions, 1973-74[1]

Item	Midwest So, 1973-74	West 1973-74
	(Cents per lb., RTC Wt.)	
Wages, salaries, fringe benefits	3.83	4.81
Packaging, supplies	1.06	1.00
Utilities, ice, freezing, storage, misc.	.64	.65
Total plant operating costs	5.53	6.46
Total plant overhead costs[2]	1.25	1.98
Total plant costs	6.78	8.44
Total assembly costs	1.54	1.10
Total distribution costs[3]	1.50	1.67
Total all costs	9.82	11.01
Number of plants covered by cost data	8	5
Volume (mil. lbs. RTC)[4]	132	24

[1] Mainly light fowl. Costs do not include further-processing operations. [2] Depreciation, repairs and maintenance, rent, taxes, interest, insurance on buildings and equipment. [3] Reflects local distribution costs plus some long-distance hauling. [4] Per year.

Of the 2.9 cents for assembly and distribution costs, over 1.3 cents was for loading and hauling live fowl from farms to plants. The balance was both for distributing within consuming markets and long-distance hauling of ready-to-cook products.

The fowl processing plants accounted for about 9 percent of the plants which slaughter any fowl, but about 30 percent of the plants which slaughter predominantly fowl and about 30 percent of total fowl slaughter. For the sample plants, over 70 percent was ice-packed, nearly 8 percent deep chill etc., and over 22 percent was frozen. Whole ready-to-cook birds accounted for over 77 percent, cut-up for about 2 percent, and the balance of nearly 21 percent was further-processed by the same plants. Nearly 15 percent was sold to retailers, almost 18 percent to distributors, over 6 percent to institutions, less than 1 percent was exported, and the remainder of over 60 percent was used directly by further-processing plants.

Egg Breaking

Records from 18 egg breaking plants and updated budgets from other studies indicated total costs for 1973-75 averaging about 8.4 cents per pound of liquid egg equivalent (table 3). About 6.2 cents were for inplant costs. Of the inplant costs,

Table 3—Egg breaking plant costs, major regions, 1973-75[1]

Item	Midwest 1973-74	West Coast 1973-75	South Northeast 1973-74[2]
	(Cents per lb., liquid egg weight)		
Wages, salaries, fringe benefits	2.45	2.37	2.40
Packaging, supplies[3]	1.53	2.43	1.80
Utilities, freezing, storage, misc.	.43	.40	.43
Total plant operating costs	4.41	5.20	4.63
Total plant overhead costs[4]	1.49	1.38	1.30
Total plant costs	5.90	6.58	5.93
Total assembly costs[5]	1.25	1.07	1.06
Total distribution costs[6]	1.46	.75	1.15
Total all costs	8.61	8.40	8.14
Number of plants covered by costs data	12	6	---
Volume (mil. cases of shell eggs broken)[7]	2.4	1.1	---

[1] Does not include egg drying costs. Includes machine and hand breaking and various plant sizes. [2] Estimated from previously published studies by updating with cost indexes. [3] Survey average for liquid and frozen eggs. Includes container cost estimate where product is further-processed in same plant. [4] Depreciation, repairs and maintenance, rent, taxes, interest, insurance on buildings and equipment. [5] Estimated from shell egg assembly costs with allowance for greater distances as appropriate. [6] Reflects local distribution costs, plus some long-distance hauling and storage. [7] Per year.

about 39 percent was for wages and salaries, over 31 percent for packaging, almost 7 percent for utilities and miscellaneous, and over 22 percent for overhead costs. Inplant costs averaged higher on the West Coast, partly because more recent cost levels were included.

The 2.2 cents for egg assembly and product distribution was about equally divided between loading and hauling eggs from farms to plants, and distributing egg products within consuming markets and long-distance hauling.

The egg breaking plants accounted for over 12 percent of total plant numbers and about 19 percent of total egg breaking volume. For the sample plants, about 36 percent of the ultimate end-products were liquid eggs, 26 percent frozen eggs, and almost 38 percent dried eggs. Sales to bakeries and institutions amounted to over 31 percent, distributors almost 14 percent, exports under 3 percent, and food manufacturing (and manufacturers) over 51 percent, with the balance going to other plants and pet food uses.

WHERE DO OUR EGG AND POULTRY DOLLARS GO?

by
Kenneth E. Blase[1]

ABSTRACT: A continuing study of marketing margins for eggs and poultry has been carried on in the Department of Agriculture since 1955. At present, complete margin information is collected for seven different poultry products sold in 12 major U.S. cities. Marketing margins increased during 1973, particularly at the retail level. They could widen further in 1974 with increase in costs of labor, transportation, and packaging materials.

KEY WORDS: Eggs, Frying Chickens, Turkeys, Prices, Margins

Questions are repeatedly asked about how much of the consumer's dollar spent in the retail store goes to farmers and how much goes to various kinds of marketing firms. USDA initiated a continuous margin series for poultry and poultry products in 1955. At present, margin information is collected for seven different poultry products sold in 12 major U.S. cities. The products included in the study are Grade A large, medium and small eggs, U.S. Grade A whole ready-to-cook frying chickens (broilers) and three sizes of U.S. Grade A ready-to-cook turkeys—small 4 to 8 pound fryer roaster turkeys, medium 8-16 pound young hen turkeys, and large 16 to 24 pound young tom turkeys. No prices are collected for turkeys over 24 pounds because birds that weigh more than 24 pounds ready-to-cook go mostly into further processed products or to the institutional trade.

The cities included in the study are Boston, New York, Baltimore, Washington, D.C., Atlanta, Cleveland, Chicago, St. Louis, Denver, Los Angeles, San Francisco, and Seattle. Prices are collected at and price spreads calculated between 4 trading levels. These levels are farm, city receiver (or first receiver), price to retailer, and retail or consumer price.

Egg prices are collected in 15 major producing areas, prices for frying chickens from 11 areas, and prices for turkeys from 6 major production areas. Information on prices at farm, to city receiver, and to retailer arefurnished by the Market News Branch of the Agricultural Marketing Service. Some prices are also furnished by State Market News offices or collected directly from industry firms. The retail prices are furnished by the Bureau of Labor Statistics from it's regular monthly survey of retail food prices.

In January of each year, the Market News representatives in each of the cities included in the study estimate percentages of eggs and poultry arriving from each of the major production areas and identify other sources of supply. This information is used to calculate a weighted average farm price for the eggs and poultry coming into each city.

Because of the high degree of contract production in the broiler industry, farm sales of live broilers are seldom made and few farm prices are estiablished. In areas where reported farm prices of broilers are not available, a farm equivalent value is calculated. In areas where it is necessary to calculate a farm equivalent value for broilers, this value is calculated by taking the f.o.b. dock price of ready-to-cook whole broilers, deducting an estimated cost of processing, and converting the remaining value back to a liveweight basis by using the average dressing percentage reported by government inspected plants for the previous year. The resulting value is the farm equivalent value of a pound of live broiler.

The difference between each level of pricing is the marketing margin. The farmer's share of the consumer's dollar is also calculated by dividing the farm price by the retail price.

Prices at levels other than retail are collected *one* day each month. The pricing date used is 5 days previous to the B.L.S. pricing date for each month to allow for sufficient time for eggs and poultry to move through the marketing channels from farm to retail

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Table 1.—Prices and price spreads for eggs, frying chickens and Turkeys for 12 major U.S. cities

Item	1972	1973	Dec. 1973
	Cents	*Cents*	*Cents*
Grade A Large Eggs			
Prices			
Farm price	29.9	52.8	61.7
Price to retailers	43.7	67.1	77.0
Retail price	52.8	77.8	87.9
Price Spreads			
Farm to consumer	22.9	25.0	26.2
Farm to retailer	13.8	14.3	15.3
Retail	9.1	10.7	10.9
Farm share of consumer's dollar	56.6	67.9	70.2
Frying Chickens			
Prices			
Farm price	19.6	34.1	27.5
Price to retailers	33.0	46.8	40.2
Retail price	42.6	60.5	54.9
Price Spreads			
Farm to consumer	23.0	26.4	27.4
Farm to retailer	13.2	12.7	12.7
Retail	9.8	13.7	14.7
Farm share of consumer's dollar	46.0	56.4	50.1
Medium Turkeys 8-16 Pounds			
Prices			
Farm price	30.2	58.7	53.6
Price to retailers	42.6	75.6	72.2
Retail price	56.1	89.6	86.4
Price Spreads			
Farm to consumer	25.9	30.9	32.8
Farm to retailer	12.4	16.9	18.6
Retail	13.5	14.0	14.2
Farm share of consumer's dollar	53.8	65.5	62.4

grocery shelf. The B.L.S. pricing date is always Tuesday, Wednesday, and Thursday of the first full week in the month.

In addition to computing annual and monthly average margin for 12 cities, averages are also computed for 5 and 10 city groupings.

For turkeys the best data are available for October, November, and December because of the concentrated marketing of turkeys then. Although attempts are made to collect data for all 12 months, average prices and margins are computed only for the fall months.

The margin data have verified some of the structural changes in the marketing system. During the 18 years, prices for broilers at the farm became increasingly hard to collect because of the trend toward contract production in the industry. With all poultry products, prices to wholesale city receivers have become scarce, indicating a declining role for city receivers and jobbers and a trend toward direct marketing from processing and packing plants to chain stores and large independent retailers. During the recent period of rapidly increasing prices, the margin series was one method used by the Cost of Living Council to monitor changes in margins at various marketing levels.

The demand for eggs and poultry was exceptionally strong in 1973 due to short supplies of and higher prices for beef and pork, increasing foreign demand, and rising consumer incomes. Prices rose both at the farm and at retail.

Marketing margins for eggs also increased. The farm to retailer margin for eggs increased by 3.6 percent while the retail margin increased by 17.6 percent. The farmer's share of the consumer's dollar spent for eggs sold in 12 U.S. cities increased from 56.6 percent in 1972 to 68.0 percent.

The overall marketing margin for frying chicken from the farm to consumer increased from 23.0 cents per pound in 1972 to 26.4 cents for 1973. The farm to retailer component of the margin actually decreased by half a cent per pound or 3 percent. At the same time, the retail margin increased from 9.8 cents per pound in 1972 to 13.7 cents per pound in 1973, an increase of nearly 40 percent. The farmer's share of the consumer's dollar spent for frying chicken sold in 12 U.S. cities increased from 46.0 percent in 1972 to 56.4 percent in 1973.

Marketings charges for medium turkeys from the farm to consumer increased 19 percent from October-December 1972 to 1973. The farm to retailer spread increased by 36 percent. The retail spread increased by 4 percent over the same period of 1972. The farmer's share of the consumer's dollar spent for medium turkeys (8-16 pounds) averaged 65.5 percent during 1973, compared with 53.8 percent during the same period of 1972.

Marketing margins can be expected to increase again in 1974 as labor, transportation and costs of packaging materials continue to rise.

The complete information generated by the margin study is published every 5 years in the form of a statistical bulletin. The latest in that series is ERS Stat. Bul. No. 524, "Prices and Price Spreads for Eggs, Frying Chickens and Turkeys in 12 major Cities 1966-71", August 1973. Current price and margin data are available upon request. Also, other margin data are regularly carried in the Marketing and Transportation Situation, which shows only U.S. averages. This data is based on differences between BLS prices and SRS's prices received by producers.

Table 1 shows some of the margin data for 1972 and 1973. This margin series will be carried in future issues of the Poultry and Egg Situation.

PRODUCTION, PRICES AND PRICE SPREADS FOR FOWL, DUCKS, AND GEESE

by
Kenneth E. Blase[1]

ABSTRACT

Retail price and production information is presented for stewing hens, duck, and goose.

Keywords: Stewing hens, duck, goose, production prices margins.

The regular continuing margin series on poultry and eggs maintained by ERS provide price and price spread information for eggs, frying chickens, and turkeys. Other poultry includes such items as stewing hens, ducks, and geese. All of these items are an important part of the poultry industry yet there is little information available either on production, or price spreads for any of them. Early in 1973 retail price information was obtained for these items for the first time. This paper is an attempt to bring together some of the available information on production and prices.

Stewing hens, either fresh or frozen and usually available, are a byproduct of the egg industry. After spending many months in the laying house, these hens are replaced with younger birds. The old birds are sold to poultry processing plants. In 1973 there were 521.5 million pounds, ready-to-cook weight, of mature chicken slaughtered under Federal inspection, most of them old hens. Most of the mature chickens are processed beyond this cut-up stage and used in such food as chicken soup, canned boned chicken, chicken pot pies, and TV dinners. However, some of the birds, particularly the heavy ones weighing 4 or more pounds ready-to-cook, are sold in the retail stores as stewing hens.

Stewing hens sold at the farm in the Southeast for an average of 29.5 cents per pound ready-to-cook weight during 1973 (table 1). The wholesale price averaged 46.4 cents per pound. The average retail price was 65.7 cents per pound. The farm-to-consumer spread averaged 36.2 cents per pound; 16.9 cents per pound made up the farm to retailer spread, and the retail spread averaged 19.3 cents. The farmer's share of the consumer's dollar spent for stewing hens averaged 44.9 percent during 1973.

Ducks are usually frozen and are normally displayed with other frozen poultry. Production of ducks, like the production of other types of poultry, is specialized. The Long Island area of New York has been noted for the production of ducks for many years. According to the 1969 Census, the latest information available only since early 1974 on the number of farms reporting an inventory of ducks sold, there were 556 farms in the State of New York reporting nearly 550 thousand ducks on hand (table 2). Duck production was also important in several other States in 1969. Farmers in Indiana, Wisconsin, California, and Missouri all reported State total inventories of more than 100,000 ducks that year.

There were more than 1 million ducks sold in New York, Indiana, and Wisconsin in 1969 (table 3). There were 152 farmers in New York reporting sales of ducks in 1969, with the average number sold being over 40,000 birds.

While the 1969 data are the latest available on number sold, data on ducks slaughtered under Federal inspection during 1973 indicate that about 11 million ducks weighing 69 million pounds were slaughtered. The five leading states in 1973 were New York, Wisconsin, Indiana, Virginia and Missouri. These States accounted for 64 percent of the ducks slaughtered under Federal inspection. The ready-to-cook duck usually weighs 4-5 pound and is packaged individually and frozen.

In 1973 the average farm value of duck ready-to-cook basis was 52.1 cents per pound. The average wholesale value for the 1973 marketing season was 71.2 cents per pound and the average retail value was 92.0 cents per pound. The farm-to-consumer spread was 39.9 cents per pound and the average retail spread was 18.4 cents per pound. The farmer's share of the Consumer dollar spent for ducks averaged 56.7 percent.

Geese appear in the frozen food cases of many grocery stores, particularly during the holiday season. Like ducks, geese are frozen and packaged

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individually. The 1969 Census shows that South Dakota leads in the number of geese on farms (table 4) and the number sold (table 5). Other States important in the production and sale of geese are Washington and Iowa. While there are exceptions such as South Dakota, average flock size for geese is much smaller than for ducks. Only 6 States reported geese slaughtered under Federal inspection during 1973. There were 4.3 million pounds liveweight slaughtered under Federal inspection in 1973, two-thirds of the volume was in South Dakota.

The estimated average liveweight for geese in 1973 was about 10 pounds. The average price per pound at the farm for the 1973 marketing season was 73.5 cents per pound ready-to-cook basis. The average wholesale price was 95.8 cents per pound and the average retail price was $1.07 per pound. The farm-to-consumer spread averaged 33.5 cents per pound. The farm-to-retail spread averaged 22.3 cents per pound and the retail spread averaged 11.2 cents per pound. The farmer's share of the consumer's dollar spent for geese averaged 69 percent during 1973.

Table 1.—Prices, price spreads, and farmer's share of the consumer's dollar spent for stewing hens, ducks, and geese, 1973

Prices	Stewing hens	Ducks	Geese
	Cents	*Cents*	*Cents*
Farm price[1]	29.5	52.1	73.5
Price to retailer	46.4	71.2	95.8
Retail price	65.7	92.0	107.2
Price spreads			
Farm to consumer	36.2	39.9	33.5
Farm to retailer	16.9	21.5	22.3
Retail	19.3	18.4	11.2
	Percent	*Percent*	*Percent*
Farm share of consumer dollar spent	44.9	56.7	68.6

[1] Ready-to-cook basis.

Table 2.—States with the largest number of ducks on farms in 1969

State	Farms reporting	Ducks on farms
	Number	*Number*
New York	556	549,116
Indiana	633	356,787
Wisconsin	1,690	234,067
California	431	170,114
Missouri	1,346	110,185
Illinois	1,474	78,714
Ohio	731	76,894
Pennsylvania	1,002	57,977
Minnesota	2,130	57,934
Iowa	2,484	42,128

Source: U.S. Census of Agriculture, page 140, Volume II, 1969.

Table 3.—States with the largest number of ducks sold in 1969

State	Farms reporting	Ducks sold
	Number	*Number*
New York	152	6,099,319
Indiana	104	2,989,133
Wisconsin	594	1,487,001
California	47	765,726
Illinois	337	646,042
Virginia	22	452,024
Ohio	149	381,600
Missouri	115	309,856
New Jersey	26	257,092
Pennsylvania	492	87,092

Source: U.S. Census of Agriculture, Page 141, Volume 11, 1969

Table 4.—States with the largest number of geese on farms in, 1969

State	Farms reporting	Geese on farms
	Number	*Number*
South Dakota	1,020	52,967
Iowa	1,235	25,181
Washington	169	18,815
Minnesota	964	17,417
Ohio	413	17,061
California	276	16,420
Indiana	403	11,529
Texas	729	8,788
Pennsylvania	389	7,840
Montana	503	7,560

Source: U.S. Census of Agriculture, Page 140, Volume 11 1969.

Table 5.—States with the largest number of geese sold in, 1969

State	Farms reporting	Geese sold
	Number	*Number*
South Dakota	386	163,568
Washington	23	72,208
Iowa	422	43,854
Minnesota	465	34,461
California	31	32,207
Indiana	101	30,448
North Dakota	198	18,933
Ohio	84	13,565
Wisconsin	306	13,361
Pennsylvania	171	12,176

Source: U.S. Census of Agriculture, Page 141, Volume II, 1969

PRICES AND PRICE SPREADS FOR TURKEYS IN NOVEMBER AND DECEMBER

by

Kenneth E. Blase and Sandra F. Lesesne
Commodity Economics Division

ABSTRACT: Although consumed during every month of the year, turkey is considered the holiday bird with more than a third of annual consumption in November-December. Turkeys are featured and prices reduced by many grocery stores during the Thanksgiving and Christmas season.

KEYWORDS: Turkey Prices, Margins, Thanksgiving, Christmas

Turkey has been considered traditional Thanksgiving and Christmas fare since the Pilgrims hunted the wild turkey to grace their table on that first Thanksgiving day.

Turkey production and marketing today is a highly efficient process, and turkey meat consumption is substantial in every month of the year. Still, more than a third of annual consumption occurs during the two holiday months.

Retail turkey prices are normally reduced considerably during the week preceding the Thanksgiving and the week preceding the Christmas holidays as retail stores feature turkeys and reduce their margins accordingly. Sample data from large chainstores indicate that selling prices were reduced 8 and 7 cents per pound, respectively, in sales prior to Thanksgiving 1972 and 1973 as compared to selling prices in the preceding week. Sales prices prior to Christmas 1972 and 1973 were 9 cents per pound lower in each period than in the preceding week. Stocks of turkey in storage are at high levels and indications are that turkey will again be specialed and prices reduced for the 1974 holiday season.

Regular margins series maintained by the Economic Research Service are based on retail prices furnished by the Bureau of Labor Statistics. Prices at other levels of trading are mainly from market news officers of the Agricultural Marketing Service. BLS prices are collected on Tuesday, Wednesday and Thursday of the first full week of the month. Accordingly, the effects of lower holiday sales prices are not reflected in the November and December values. If these sales prices were included, November and December retail margins would be lowered substantially, and annual averages reduced accordingly.

BLS retail prices on turkeys are collected for three different sizes of stores (all chain stores, large independent stores, and small independent stores). In December 1972, the composite BLS retail price for 10 major cities was 56.7 cents per pound for medium sized (8-16 pounds) young hen turkeys. The price in all chain stores averaged 55.6 cents compared with 60.3 cents in large independent stores and 58.6 cents per pound in small independent stores. In December 1973, the composite BLS price for 10 major cities was 87.7 cents per pound for medium turkeys. All chain store prices averaged 84.6 cents, compared with 90.0 cents in large independent stores and 89.9 cents per pound in small independent stores.

Table 1 compares BLS retail prices for November and December 1972 and 1973 with prices charged by a sample of large chain stores before and during the holiday shopping weeks for medium sized turkeys. This is usually the size desired by most consumers at these seasons, though some families may prefer the 4-8 pound fryer-roaster size or the 16-24 pound heavy young toms. Most of the larger toms, incidentally, are sold to the institutional trade or used in further processing.

Table 1—Prices and price spreads for medium turkeys, November-December, 1972 and 1973, regular margins series for 10 cities and large chainstore prices

Item	November		December	
	1972	1973	1972	1973
Margins Series:				
Farm price	29.9[2]	57.0[3]	32.4[2]	53.9[3]
Price to retailer	41.8	73.3	46.3	72.3
Retail price[1]	57.1	91.1	56.7	87.7
Price Spreads:				
Farm to consumer	27.2	34.1	24.3	33.8
Farm to retailer	11.9	16.3	13.9	18.4
Retail	15.3	17.8	10.4	15.4
Large Chainstore Prices:				
Before holiday	51.0	82.0	52.0	81.0
Holiday sales	43.0	75.0	43.0	70.0

[1] BLS composite price for all sizes of stores the first week of the month. [2] 8 city average. [3] 9 city average.

Turkey For Christmas Dinner

With the abundant supplies many families will be preparing turkey for Christmas dinner. In a survey of more than 2,000 families in 1974, 60 percent said they had prepared a whole turkey in the previous 12-month period. A majority of these also reported cooking stuffing with the turkey.

The handling and cooking of turkey in the kitchen should be done carefully. Careless preparation and handling before and after cooking can lead to bacterial diseases such as salmonellosis. Temperature and time influence bacteria growth. The USDA recommends that hot foods should be kept hot (above 140 degrees F) and cold foods cold (below 40 degrees F). Food may not be safe to eat if held for more than 2 or 3 hours at temperatures between 60 degrees and 120 degree F. These time-temperature relationships apply to turkey preparation and handling.

Fresh poultry can contain salmonella bacteria and when the turkey is stuffed this bacteria may be transferred to the stuffing. For complete safety the stuffing should be cooked in a seperate container. However, if the stuffing is cooked inside the turkey, be sure it is cooked thoroughly to a temperature of at least 165 degrees. The tighter the stuffing is packed in the turkey the longer it takes for the heat to penetrate.

CHANGES IN MARKETING COSTS AND PRICE SPREADS, 1970-77

by George B. Rogers
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ABSTRACT: Packing and processing costs and price spreads for eggs and poultry have been on the rise since 1970, with increasing costs for inputs outweighing gains in operating efficiency. Price spread components for assembly, long-distance hauling, and wholesale distributing have also tended to rise although increased production density, heavier loadings, changes in methods, and more direct marketing channels have curtailed the extent of such increases. Retail spreads are not strictly cost-related and vary from year to year.

KEYWORDS: Marketing, Costs, Price Spreads, Eggs, Broilers, Turkeys.

Price spreads and their cost and profit components for particular marketing functions may be used to monitor marketing changes. Based on index numbers of costs for such inputs as packaging materials, labor, energy, buildings and equipment, interest, taxes, and insurance, marketing costs would all have risen materially since 1970. However, changes in marketing channels and practices and gains in operating efficiency often offset input cost increases. Breakdowns of the price spread series contained in ERS market basket statistics and price spread series maintained by the Poultry Program area for major cities provide measurements of the overall effects of various forces.

The costs of packing cartoned eggs for the consumer trade have risen over 3 cents per dozen since 1970. About two-thirds of this increase has occurred over the last 3 years.

Detailed information on the costs of packing Grade A large cartoned eggs from the No. 1 Nest Run grade is available for five periods since mid-1974. Members of Egg Clearinghouse, Inc. (ECI), have voluntarily submitted records through ECI for analysis by the author (table 1). These records show an increase of almost 2¼ cents per dozen to mid-1977. Packing material costs have risen steadily since mid-1974. Due to variations in the number and composition of plants included in the various samples, average values for plant operating and administrative and overhead costs show some variations, although plant operating costs, in particular, appear to be trending upward.

Grade yield and size loss varies with the level of egg prices and with the discounts which exist under Grade A large eggs for smaller eggs and those of lower grade. A good quality No. 1 Nest Run pack may contain 3 percent Jumbos, 16 percent Extra Large, 55 percent Large, 15 percent Mediums, 1 percent Small, 8 percent Undergrade, and 2 percent loss. The extra value of the Jumbo and Extra Large eggs is much more than offset by the lower values for small sizes, undergrades, and loss. But the net value varies with market conditions. For example, a strong breaker market for small sizes and undergrades narrows the discounts and reduces grade and size loss. A high No. 1 price tends to increase the value of the loss factor.

The estimated components of the market basket series for eggs in table 2 do not show grade and size loss since they are predicated on the value of Grade A large eggs at the farm level. Price spread components reflect profits as well as costs. Packing spreads in table 2 include only a partial credit for the value of cases and filler flats received with loose-packed eggs. Some cartoning plants use new cases, and some receive cases and flats of lower quality than ECI trading standards allow. Packing spreads have risen steadily since 1970. Increases in

Table 1—Costs of packing Grade A Large eggs in cartons from No. 1 Nest Run grade [1]

Item	Period ending				
	Mid-1974	Mid-1975	Mid-1976	End 1976	Mid-1977
	Number				
Firms	21	18	22	14	25
Plants	45	51	39	14	50
	Cents per dozen				
Costs for—					
Packing materials	4.33	4.55	4.68	4.83	4.62
Plant operating costs	2.52	3.56	3.36	3.69	3.86
Administrative and overhead costs	1.72	1.60	1.71	1.28	1.57
Subtotal	8.57	9.71	9.75	9.80	10.35
Less: value of case and filler flats rec'd on an ECI trade	-1.59	-1.60	-1.60	-1.51	-1.50
Subtotal	6.98	8.11	8.15	8.29	9.85
Grade yield and size loss	2.99	2.66	2.56	3.10	3.35
Net cost	9.97	10.77	10.71	11.39	12.20
Change from 1974	---	+.80	+.74	+1.42	+2.23
Some factors affecting grade yield and size loss:					
No. 1 Nest Run price	46.0	44.5	49.9	63.0	47.7
Average discount for mediums	10.5	7.5	6.2	6.0	7.7
Average discount for undergrades [2]	10.0	11.3	10.9	15.4	18.4

[1] Based on records submitted to Egg Clearinghouse, Inc. by member plants. Revised from previous summaries to standardize treatment of costs of packing materials and grade and size loss. [2] Mainly grade B eggs and checks.

Table 2—Price spreads and components for Grade A large cartoned eggs, 1970-77

Item	1970	1971	1972	1973	1974	1975	1976	1977[1]
	Cents per dozen							
Market Basket series [2]								
Assembly	0.8	0.8	0.8	0.9	1.1	1.1	1.0	1.2
Packing	6.9	7.2	7.6	8.1	8.7	9.3	9.6	10.3
Long-distance transportation	1.3	1.3	1.2	1.2	1.4	1.4	1.4	1.6
Wholesaling	2.7	2.8	2.8	2.8	3.2	3.7	3.4	3.5
Retailing [3]	11.2	10.5	10.0	10.7	10.7	10.7	10.7	12.7
Total	22.9	22.6	22.5	23.7	25.1	26.2	26.1	29.4
10-city price spreads [4]								
Farm to retailer	13.6	13.2	14.0	14.6	13.8	15.5	16.7	17.0
Retail	9.9	10.1	9.9	11.4	12.5	12.0	13.2	13.9
Total	23.5	23.3	23.9	26.0	26.3	27.5	29.9	30.9

[1] Preliminary. Jan.-June only. [2] U.S. average. Components estimated. [3] In-store only. [4] For major cities.

spreads for assembly, long-distance transportation, and wholesale distributing have also tended to show up. But the extent of these increases has been moderated by increased production density, heavier loadings, changes in methods, and more direct marketing channels.

Price spread components of the market basket series for broilers and turkeys (tables 3 and 4) show similar trends to those for eggs. For all three commodities, retail spreads show some year-to-year variations. This is because retail spreads are only partially cost-related, also reflecting retailer pricing policies on various competing commodities.

Average farm-to-consumer price spreads for 10 major cities are typically wider than those in the market basket series. The latter are U.S. averages and include the large shares of volume which do not move between regions. For example, only about one-fifth of the market eggs, over half of the broilers, and about one-third of the turkeys move between regions. In contrast, larger cities are likely to draw at least some supplies from considerable distances, and the distribution system in metropolitan areas may be more complex and costly. Differences in the farm-to-retailer and retail spreads in the two series arise in part from the price series available for the 10-city averages. The prices to retailers often reflect some warehouse deliveries and, thus, the retail spreads reflect some warehouse and delivery costs.

Table 3—Prices spreads and components for ready-to-cook broilers, 1970-77

Item	1970	1971	1972	1973	1974	1975	1976	1977[1]
	Cents per pound							
Market Basket series[2]								
Assembly	1.0	1.0	1.0	1.2	1.4	1.4	1.4	1.3
Processing	5.4	5.7	6.2	6.7	7.2	7.5	7.8	8.0
Long-distance transportation	1.0	1.0	1.1	1.1	1.4	1.4	1.4	1.3
Wholesaling	2.8	2.8	2.9	2.9	3.3	3.9	3.7	3.6
Retailing[3]	11.9	11.2	10.1	12.4	11.2	12.0	12.6	12.3
Total	22.1	21.7	21.3	24.3	24.5	26.2	26.9	26.5
10-city price spreads[4]								
Farm to retailer	12.6	12.3	12.6	13.0	12.2	13.7	14.6	14.1
Retailer	11.8	11.1	10.6	14.1	14.8	14.9	16.7	15.8
Total	24.4	23.4	23.2	27.1	27.0	28.6	31.3	29.9

[1] Preliminary. Jan.-June only. [2] U.S. average. Components estimated. [3] In-store only. [4] For major cities.

Table 4—Price spreads and components for ready-to-cook turkeys, 1970-77

Item	1970	1971	1972	1973	1974	1975	1976	1977[1]
	Cents per pound							
Market Basket series[2]								
Assembly	0.7	0.7	0.7	0.8	1.0	1.0	1.0	0.9
Processing, regular[3]	6.5	6.6	6.7	7.3	8.1	8.6	9.1	9.1
Processing, other[4]	2.0	2.1	2.1	3.4	5.1	3.9	3.6	2.0
Long-distance transportation	1.1	1.1	1.1	1.1	1.4	1.4	1.4	1.1
Wholesaling	3.0	3.0	3.1	3.1	3.5	3.5	3.6	3.1
Retailing[5]	9.6	10.3	10.2	11.2	14.8	11.8	14.4	11.9
Total	22.9	23.8	23.9	26.9	33.9	30.2	33.1	28.1
10-city price spreads[6]								
Farm to retailer	12.6	12.8	12.8	15.4	16.6	17.6	17.3	---
Retailer	13.3	13.6	13.8	14.7	14.4	14.3	17.9	---
Total	25.9	26.4	26.6	30.1	31.0	31.9	35.2	---

[1] Preliminary. Jan.-June only. Individual components not comparable to full years because of differing practives on smaller seasonal output and more limited distribution. [2] U.S. average. Components estimated. [3] Whole ready-to-cook regular brands. [4] Includes special brands and some whole bird processed. [5] In-store only. [6] For 10 major cities. Oct.-Dec. only.

CONSUMPTION TRENDS AND MARKET PROSPECTS FOR FURTHER PROCESSED POULTRY

By Harold B. Jones, Jr.[1]

ABSTRACT: Consumption of further processed poultry products (chicken and turkey) has increased sharply since 1965—from 3.8 pounds per person to 7.8 pounds in 1972. Consumption of further processed poultry products now accounts for 15 percent of total U.S. poultry meat consumption. The increased demand for convenience foods provides opportunities for expanded sales of further processed poultry products, implying increased income for the poultry industry and expanded total consumption of chicken and turkey meat.
KEY WORDS: Further processed poultry products, chicken, turkey, consumption, projections.

Further processed poultry products are a fast growing segment of the poultry industry. In three decades, consumption of total chicken and turkey meat has tripled—from 17 pounds per person in 1940 to nearly 52 pounds in 1972. Consumption of further processed poultry products has increased even faster-from 0.4 pounds per person in 1940 to 7.8 pounds in 1972 (table 1). Further processed poultry products now account for 15 percent of total poultry meat consumption. Growing popularity of convenience foods for both home and institutional use may boost per capita use of these products by 40 percent over the next decade.

Wide Varitety of Product Forms

Turkeys, fowl, and broilers are further processed. Turkey products are the most important by volume

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Table 1.—Per capita consumption of poultry meat and further processed poultry, United States, 1940-1972

Year	Poultry meat				Further processed poultry meat	Further processed as proportion of total poultry meat
	Broilers	Fowl	Turkey	Total		
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Percent*
1940	2.0	12.1	2.9	17.0	0.38	2.3
1945	5.0	16.6	3.5	25.1	1.05	4.2
1950	8.7	11.9	4.1	24.7	1.00	4.0
1955	13.8	7.5	5.0	26.3	1.10	4.2
1960	23.3	4.7	6.1	34.1	2.24	6.6
1965	29.4	3.9	7.4	40.7	3.83	9.4
1966	32.2	3.8	7.8	43.8	4.44	10.1
1967	32.7	4.4	8.6	45.7	4.84	10.6
1968	33.0	4.4	7.9	45.3	5.40	11.9
1969	35.1	3.9	8.4	47.4	6.04	12.7
1970	37.4	4.1	8.2	49.7	6.31	12.7
1971	37.1	4.3	8.5	49.9	7.05	14.1
1972	38.8	4.1	9.1	52.0	7.85	15.1

Source: *Egg and Poultry Statistics Through Mid-1961*, Stat. Bul. 305, U.S. Dept. of Agriculture, March 1962; and *Poultry and Egg Situation*, PES 276, Economic Research Service, U.S. Dept. of Agriculture, Washington, D.C., April 1973.

with 639 million pounds of ready-to-cook turkey meat further processed in 1972. This compares with 466 million pounds of fowl and 437 million pounds of broilers. Processing uses nearly 90 percent of the fowl and 35 percent of the turkeys but only 6 percent of the broilers.

Turkey products include mainly frozen roasts sold raw to consumers in various package combinations, cooked rolls sold primarily to institutional markets or for slicing, turkey pot pies and frozen dinners, bulk meat and parts, and other specialized products. Turkey roasts, which first appeared in substantial volume in 1963, have been one of the fastest selling processed poultry products.

Fowl meat is used primarily for soup, pot pies, canned boned meat, and other specialty items such as hash, stew, and fricassee. Some fowl are also canned as whole birds, and others are used as ingredients for salads, baby foods, and dumplings.

Broilers are sold in further processed form as breaded and precooked parts, whole barbecued birds, fried chicken dinners, as rolls and roasts, sliced entrees, and in many specialty items such as steaks, patties, diced chicken, pot pies, and baby foods. Sales have grown rapidly since 1960, when cooked parts first began to sell in volume. At first, sales of precooked parts were about evenly divided between retail and institutional markets, but in the last few years institutional sales have been increasing much more rapidly. Frozen chicken dinners also have rapidly become an important outlet for further processed broiler meat.

Market Characteristics

The market for further processed poultry products can be classified into four sectors: (1) the consumer or retail food market, (2) the institutional market, (3) the export market, and (4) special Government food distribution programs. The first two sectors constituted close to a $2 billion annual market for poultry products, compared with 1972 exports of poultry specialties totaling less than $5 million and Government purchases ranging from $40 to $60 million in 1969-72.

Retailers and institutions are the largest sectors of the food market. Consumer expenditures for all food totaled about $116 billion in 1972. Prior to 1960, further processed poultry products accounted for less than 1 percent of total consumer food purchases. They now account for nearly 1.8 percent.

The institutional market is made up of three segments: (1) traditional institutional outlets such as hospitals, camps, schools, and other in-house feeding establishments, (2) commercial restaurants and eating establishments including hotels, motels, and private clubs, and (3) the relatively new and fast growing employee feeding operations, cafeterias, caterers, and automatic vending machine. Chicken franchising outlets have been one of the most dynamic segments of the restaurant category. Most of this chicken is sold to these outlets as raw cut-up parts and is not classified as a further processed product. Industry estimates indicate that 10-15 percent of the broilers and fryers are sold through chicken franchised outlets, accounting for more than 900 million pounds annually.

About 5 to 10 percent by weight of U.S. poultry meat exports are processed products, mainly canned poultry and speciality items. Although relatively small these exports were among the fastest growing categories in 1972.

Demand and Consumption Estimates

Rapid growth of further processed poultry items began in the mid-1950's with frozen meat pies and TV dinners, and has paralleled the boom in convenience frozen foods. Meanwhile, portion control chicken items were becoming established in the institutional trade. Turkey rolls became an important institutional product in the early 1960's, followed by turkey roasts in consumer markets in 1964. Sales of turkey roasts have increased very rapidly over the last several years. More recently, frozen entree products, including chicken and gravy, and other specialty products have become an important segment of the market. Sales of frozen precooked poultry products have also increased rapidly in the last few years.

Survey reports and studies of consumer purchase patterns in the mid-1960's indicated that one-half to two-thirds of U.S. families purchased further processed poultry products at least once a year. There were wide variations in consumption patterns for specific items. More recent studies have indicated a relatively low rate of market penetration for many processed products. Less is known about institutional markets, but they too appear to have a low rate of market penetration.

By 1980, further processed products are expected to increase their share of total poultry meat consumption from the present level of about 15 percent. At the highest level projected, 18 percent, per capita consumption of processed poultry products would increase 40 percent to about 11 pounds (table 2). This increase would be equivalent to a rise in processed poultry's share of total consumer expenditures for food from about 1.8 percent currently to 2.0 percent in 1980. Further processed poultry products would then account for nearly 30 percent of consumer expenditures for all poultry and eggs compared with a current level of about 24 percent. Processed poultry products will probably also increase their share of the frozen food market slightly in the years ahead, perhaps to a tenth of frozen food sales.

Increased consumption of further processed poultry products by 1980 is likely to be mainly

Table 2.—Per capita consumption of further processed poultry products, United States, 1950-1972, with projections to 1975 and 1980.[1]

Year	Per capita consumption				Total
	Broilers	Fowl	Turkey	Other[2]	
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1950	---	---	---	---	1.00
1956	.09	.87	.20	---	1.16
1960	.56	1.70	.56	.05	2.24
1965	.71	1.59	1.30	.23	3.83
1966	.91	1.53	1.70	.30	4.44
1967	1.10	1.74	1.60	.40	4.84
1968	1.26	1.88	1.90	.36	5.40
1969	1.34	1.86	2.43	.41	6.04
1970	1.65	1.92	2.34	.40	6.31
1971	1.85	2.07	2.72	.41	7.05
1972	2.09	2.23	3.06	.47	7.85
1975 (a) low	2.65	2.25	3.50	---	8.40
(b) medium	2.80	2.25	3.75	---	8.80
(c) high	3.10	2.25	4.00	---	9.35
1980 (a) low	2.75	2.25	4.00	---	9.00
(b) medium	3.25	2.25	4.50	---	10.00
(c) high	3.75	2.25	5.00	---	11.00

[1] Projections derived from trend extrapolations and share of the market estimates for three alternative levels of consumption. Based on ready-to-cook weight equivalent. [2] Includes miscellaneous parts, fat, ducks, and other items not otherwise classified.

broilers and turkeys (table 2). However, the largest growth is expected in broiler and turkey products since a large proportion of fowl are already being further processed and the number of fowl and farm chickens is not likely to expand as rapidly as meat-type birds in the years ahead.

Depending on the method of projection used, estimates of output for further processed poultry products in 1980 range from 2.0 to 2.5 billion pounds, ready-to-cook. Table 3 shows the estimated output for 1975 and 1980 for each method of projection. Results from the different methods show a similar pattern, indicating production may approach 2.3 billion pounds by 1980.

Table 3.—Summary of estimated output of further processed poultry products in 1975 and 1980 using three different methods of projection[1]

Method used	Projected total output[3]	
	1975	1980
	Billion pounds	*Billion pounds*
Product life cycle		
Exponential growth curve	1.90	2.20
Demand estimates[2]		
High consumption rate	2.00	2.50
Medium consumption rate	1.90	2.28
Low consumption rate	1.81	2.05
Share of market		
Total poultry meat (pounds)	1.80	2.50
Total consumer expenditures for food (dollars)	1.85	2.33
Consumer expenditures for poultry and eggs (dollars)	1.77	2.50
Total frozen food sales (pounds)	1.80	2.25

[1] Includes output of all types of further processed products based on ready-to-cook weight equivalent. [2] Projections based on U.S. population of 215.4 million in 1975 and and 227.7 million in 1980 (U.S. Census Bureau projections, Series D). [3] Projected output at a medium consumption rate of 10 pounds per capita in 1980 would consist of 1,030 million pounds of turkey, 740 million pounds of broilers, and 510 million pounds of fowl, for a total of 2,280 million pounds.

Market Potential

The expanding market for further processed poultry products since 1955 can be attributed mainly to the rapid growth of frozen convenience food products, the changing structure and purchasing patterns of institutional markets, and improved and more efficient techniques of producing, processing, and marketing poultry meat.

In the past decade the food industry as a whole can atrribute much of its growth in sales to population increases, growing incomes and purchasing power as well as to changing tastes and new products. However, changing taste and preferences and new products accounted for nearly all of the growth in sales of further processed poultry products in the past 15 years. It was the increased market penetration of these products that led to the rapid market expansion. In terms of the poultry meat industry as a whole, however, the increased output of further processed products accounted for only about one-third of the total increase in consumption of poultry meat in the past decade.

Consumption will probably continue to increase, but at a slower rate than in the past decade. Further processed poultry products appear to be entering a stage in the product life cycle where the rate of growth may begin to drop. The extent of the slowdown will depend upon future market penetration rates and the extent to which successful new products or processes can be developed. However, other food products or vegetable protein substitutes may eventually replace some of the traditional processed poultry products.

Despite the possibility of a slower growth rate, there are a number of positive factors to consider in assessing the market potential for further processed poultry products in the years ahead:

(1) a growing and more affluent society with an increasing demand for convenience foods,
(2) a continuation of processed poultry products' expanding share of the rapidly growing convenience food market,
(3) the current low level of market penetration for many processed poultry products,
(4) a number of products still in the rapid growth stage of the product lift cycle, and
(5) the continued emphasis on improved production and processing technology which has traditionally characterized the poultry industry and has led to economies of mass production.

These factors should provide a large potential market for processed poultry products in the years ahead.[2]

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[2]For further information on the market potential for further processed poultry products see "The Market Potential for Further Processed Poultry Products," Res. Bul. 118, Univ. of Ga., Athens.

SUPPLY AND UTILIZATION DATA REVISED

By
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ABSTRACT

The supply and utilization estimates for poultry were revised back to 1960 to reflect changes in the procedure used to estimate production and changes in the foreign trade categories. Estimates for chicken were broken out into young chicken and other chicken.

KEYWORDS: Supply, utilization, young chicken, other chicken, consumption.

The supply and utilization and per capita consumption estimates for chicken and turkeys have been revised back to 1960. The major change in the supply and utilization tables is that chicken has been broken out into young chicken and other chicken. Also, slight changes have been made in the procedure used to estimate ready-to-cook production. Some changes also were made in the foreign trade categories.

In previous years only a supply and disposition table for total chicken has been published. In order to satisfy numerous requests, the supply and utilization of chicken has been divided between young chicken and other chicken (tables 1 and 2). The term "young chicken" is used instead of "broilers" because other young chickens—such as rock cornish hens and roasters—are included. The data used to arrive at the estimates for young chickens do not distinguish between broilers and other young chickens. However, broilers probably make up almost all of the young chickens. Birds included in the other chicken category are mainly old layers from the table egg laying flocks and hatchery supply flocks.

The figures on supply and utilization and per capita consumption are "estimates" because much of the data used to calculate them are not available on a

Table 1—Young chicken: Supply and utilization[1]

Year	Production	Beginning stocks	Total supply	End stocks	Exports and shipments	Military	Civilian disappearance	Per capita
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Pounds*
1960	4,334	37	4,371	35	102	69	4,165	23.4
1961	4,944	35	4,979	49	159	72	4,699	25.9
1962	4,997	49	5,046	42	188	78	4,738	25.8
1963	5,269	42	5,311	44	130	78	5,059	27.1
1964	5,444	44	5,488	37	132	82	5,237	27.7
1965	5,872	37	5,909	34	122	83	5,670	29.6
1966	6,437	34	6,471	56	139	89	6,187	32.0
1967	6,552	56	6,608	56	138	93	6,321	32.4
1968	6,653	56	6,709	26	144	82	6,457	32.8
1969	7,175	26	7,201	34	159	78	6,930	34.8
1970	7,687	34	7,721	52	178	58	7,433	36.9
1971	7,724	52	7,776	40	196	56	7,484	36.7
1972	8,147	40	8,187	29	198	40	7,920	38.4
1973	8,025	29	8,054	33	193	38	7,790	37.4
1974[2]	8,127	33	8,160	37	222	32	7,869	37.5

[1] Ready-to-cook weight. [2] Preliminary.

Table 2—Other chicken: Supply and utilization[1]

Year	Production	Beginning stocks	Total supply	End stocks	Exports and shipments	Military	Civilian disappearance	Per capita
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Pounds*
1960	810	124	934	95	52	5	782	4.4
1961	805	95	900	111	60	7	722	4.0
1962	792	111	903	82	57	20	744	4.1
1963	753	82	835	91	58	6	680	3.7
1964	751	91	842	102	72	5	663	3.5
1965	746	102	848	74	46	11	717	3.8
1966	761	74	835	107	28	8	692	3.6
1967	827	107	934	114	18	11	791	4.1
1968	769	114	883	71	18	18	776	3.9
1969	732	71	803	76	7	10	710	3.6
1970	776	76	852	112	4	11	725	3.6
1971	779	112	891	109	5	19	758	3.7
1972	742	109	851	82	8	12	749	3.6
1973	725	82	807	114	10	9	674	3.3
1974[2]	792	114	906	138	13	12	743	3.6

[1] Ready-to-cook weight. [2] Preliminary.

Table 3—Turkey: Supply and utilization, 1960-74

Year	Supply			Total use	Utilization			
	Production	Beginning stocks	Total supply		Exports and shipments	Military	Civilian disappearance	Per capita consumption
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Pounds*
1960	1,166	149	1,315	1,155	24	32	1,099	6.2
1961	1,495	160	1,655	1,392	28	29	1,335	7.4
1962	1,294	263	1,557	1,354	37	34	1,283	7.0
1963	1,351	203	1,554	1,337	31	40	1,266	6.8
1964	1,453	217	1,670	1,463	43	36	1,384	7.4
1965	1,515	207	1,722	1,522	58	40	1,424	7.5
1966	1,674	200	1,874	1,607	47	56	1,504	7.8
1967	1,870	267	2,137	1,770	49	53	1,668	8.6
1968	1,611	367	1,978	1,661	41	63	1,557	7.9
1969	1,606	317	1,923	1,731	40	48	1,643	8.3
1970	1,732	192	1,924	1,705	43	49	1,613	8.0
1971	1,779	219	1,998	1,775	27	41	1,707	8.4
1972	1,915	223	2,138	1,930	42	42	1,846	9.0
1973	1,933	208	2,141	1,860	54	31	1,775	8.5
1974[1]	1,912	281	2,193	1,918	43	29	1,846	8.8

[1] Preliminary.

ready-to-cook weight basis. Data are available on the amount of chicken and turkey slaughtered under federal inspection on a ready-to-cook weight basis. Although the federally inspected output is making up a larger percentage of total production each year, in previous years the nonfederally inspected output was a significant amount of total production. Also, since 1970, total production of chicken has been reported on a December-November marketing year. Thus, the total liveweight production has to be converted to a ready-to-cook equivalent for the calendar year.

Another problem arose in estimating the production of chicken other than young chicken. Data are reported for the total liveweight pounds of chicken sold and consumed on farms where produced and the amount of mature chicken slaughtered under federal inspection. However, there is a significant difference between the total mature hens slaughtered under federal inspection and total reported sales. Thus, we do not know what percentage of the pounds sold are actually consumed. In the supply and utilization table for other chicken all the pounds sold except cold storage stock changes are assumed to be consumed within the same year (table 2).

The procedure for estimating ready-to-cook weight production was changed slightly in order to include only meat that is consumed domestically or exported in our production estimates of chicken and turkey. All

condemnations are excluded. The new procedure attempts to take into consideration the condemnation of nonfederally inspected output and the condemnations that occur when chicken and turkey meat is cut up and further processed. The amount of nonfederally inspected output that is condemned is not known. However, the amount condemned was estimated by using the percentage condemned under federal inspection during the same year.

The amounts of ready-to-cook chicken and turkey meat imported, exported, shipped to American territories, or purchased by the military are very hard to estimate. In some of the census classifications it is impossible to determine how much meat is present, what kind of meat (chicken, turkey or other poultry) it is, and what is its ready-to-cook equivalent. In order to minimize errors, the import and export categories in the supply and utilization tables for chicken and turkey only include readily identifiable meat. However, additional data on the exports and imports of poultry are furnished in tables 4 and 5. The data in these tables are not included in the supply and utilization tables and have not been converted to a ready-to-cook basis.

The changes in the supply and utilization resulted in small changes in the consumption estimates for chickens and turkeys. The consumption estimates for chicken other than young chicken showed the largest percentage changes from the old estimates. Nonfederally inspected slaughter makes up a larger percentage of the total production of mature chicken than it does with young chicken or turkey. Thus, when the procedure used to estimate ready-to-cook production was changed to take into consideration condemnations of nonfederal slaughter, the largest changes occurred in the estimates for chicken other than young chicken.

Table 4—Exports: Selected poultry products, 1965-74

Year	Canned poultry[1]	Poultry specialities[2]	Poultry livers[3]
	Thousand pounds	*Thousand pounds*	*Thousand pounds*
1965	19,785	1,463	2,271
1966	15,680	2,996	2,653
1967	15,370	2,031	4,815
1968	11,561	1,918	4,885
1969	5,287	2,774	5,495
1970	3,704	2,635	4,674
1971	3,432	2,643	4,417
1972	6,581	4,380	4,732
1973	2,797	6,715	5,025
1974	3,099	4,709	3,240

[1] Poultry, except soups, in airtight containers. [2] Poultry specialities and poultry products not in airtight containers, not elsewhere counted. [3] Poultry livers, fresh, chilled or frozen.

Table 5—Imports: Poultry and poultry products, 1965-74

Year	Live birds[1]	Fresh or frozen[2]		Prepared or perserved birds[4]
		Chicken[3]	Turkey	
	Thousand pounds	*Thousand pounds*	*Thousand pounds*	*Thousand pounds*
1965	197	79	0	72
1966	184	91	54	104
1967	395	95	0	157
1968	312	7	8	201
1969	665	3	28	372
1970	6,071	55	140	592
1971	3,259	290	0	650
1972	250	197	8	710
1973	5,569	251	0	575
1974	2,099	44	0	1,185

[1] Live baby chicks are not included. [2] Whole or parts. [3] Includes ducks, geese, guineas, and game birds. [4] Prepared or preserved birds not elsewhere counted.

QUARTERLY BROILER PRICE PREDICTIVE EQUATIONS

by Gerald R. Rector
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ABSTRACT: Equations were developed to predict quarterly broiler prices based upon the factors that influence them. Multiple regression analysis was used to relate wholesale broiler prices to the per capita consumption of beef, pork, young chicken, and turkey, plus per capita disposable income. As expected, per capita consumption of chicken and income had the greatest impact on broiler prices. The equation predicted well in 1976.

KEYWORDS: Broiler prices, consumption, income, predictive accuracy.

Equations were developed to predict quarterly broiler prices based upon the economic environment that generates broiler prices. A set of possible explanatory variables, data, and procedures to analyze the data was assembled from general knowledge of the broiler industry and from examination of previous studies on the subject. The main criteria used in the development and selection of an equation was predictive capability, coupled with ease of use and updating.

Description of the Equation

The equation is a linear, price-dependent equation in which the deflated wholesale broiler prices are specified as a function of the per capita consumption of beef, pork, young chicken, and turkey, plus per capita disposable income expressed in 1972 dollars. Deflated broiler prices and disposable income in 1972 dollars were used in order to minimize the impact of inflation through time. The equation was estimated by ordinary least squares using quarterly data for 1960-75. The equation below is the one selected for presentation. Numbers in parentheses below the equation coefficients are the "t" values, a measure of statistical reliability of the coefficients. The R^2 (corrected for degrees of freedom), the standard error of the estimate, and the Durbin-Watson statistic are listed below the equation.

$$\begin{aligned} DWBP = {} & 70.9978 - .6787PCAB - .8856PCP - 3.8024PCYC \\ & \quad (2.79) \qquad (5.58) \qquad (6.60) \\ & - 3.5038PCT^* + 9.3826RPDI - 13.2578S1 \\ & \quad (2.04) \qquad (5.49) \qquad (1.91) \\ & - 11.2413S2 - 10.2682S3 + 2.5818D2 + 7.1269D3 \\ & \quad (1.61) \qquad (1.46) \qquad (1.48) \qquad (3.88) \end{aligned}$$

$R^2 = .857$ S.E.E. = 1.41 D.W. = 1.26

The dependent variable (DWBP) was constructed by dividing the reported quarterly average wholesale price by the quarterly consumer price index for all items (1967=100). The explanatory variables PCAB, PCP, and PCYC are the quarterly per capita consumption of beef and veal, pork, and young chicken, respectively. The PCT* variable is the per capita consumption of turkey. The variable enters the equation only in the fourth quarter, the observations for the other three quarters were set equal to zero. This specification resulted from the fact that equations estimated for each quarter showed that per capita consumption of turkey was not a significant variable in the first three quarters but was very significant in the fourth. The variable RPDI is quarterly per capita disposable income expressed in 1000's of 1972 dollars.

The variables S1, S2, and S3 are 0, 1 quarterly dummy variables to account for seasonality in demand by measuring changes in the level of demand from one quarter to the next. These dummy variables in effect separate the basic equation into four separate quarterly equations which differ only in the value of the constant term or intercept.

Two dummy variables (D2, D3) were also included for the second and third quarters of 1973 in order to remove the impact of price controls in those quarters. Since these variables have values of zero in every quarter but the second and third quarters of 1973, they are not used when predicting prices for any year but 1973.

Evaluation

The following chart shows how well the equation predicts quarterly broiler prices for 1970-76. The actual and predicted prices are deflated, wholesale broiler prices. The chart shows that the equation catches most of the upturns and downturns.

The second and third quarter of 1973 predictive prices are exactly the same as the actual prices because the variables D2 and D3 force them to be.

Good predictive capacity is expected within the period of fit (1960-75), but this equation also predicted well outside the period. The predicted quarterly wholesale broiler prices (in cents per pound) for 1976 were 40.1, 43.5, 40.6, and 36.0. The predicted undeflated prices were calculated by multiplying the predicted deflated prices by the consumer price index for all items (1967=100). The actual 9-city quarterly averages in 1976 were 42.2, 41.7, 41.5, and 35.5. Since this equation is designed with short run forecasting in mind, testing the equation four quarters ahead of the period was considered reasonable. Since its performance is reasonable, this specification should prove useful for future analysis.

Table 1 gives the estimated quarterly flexibility coefficients calculated at the 1960-75 quarterly mean values. At the mean values, the largest percentage changes in the deflated wholesale price of broiler chicken would be from income and the consumption of chicken. Beef, pork, and income show their largest quarterly impact in the fourth quarter. Chicken has about the same impact in the second, third, and fourth quarters; the first quarter was only slightly lower. Given the linear equation used to estimate the flexibility coefficients, these coefficients will vary as the prices and quantities vary at different points in time.

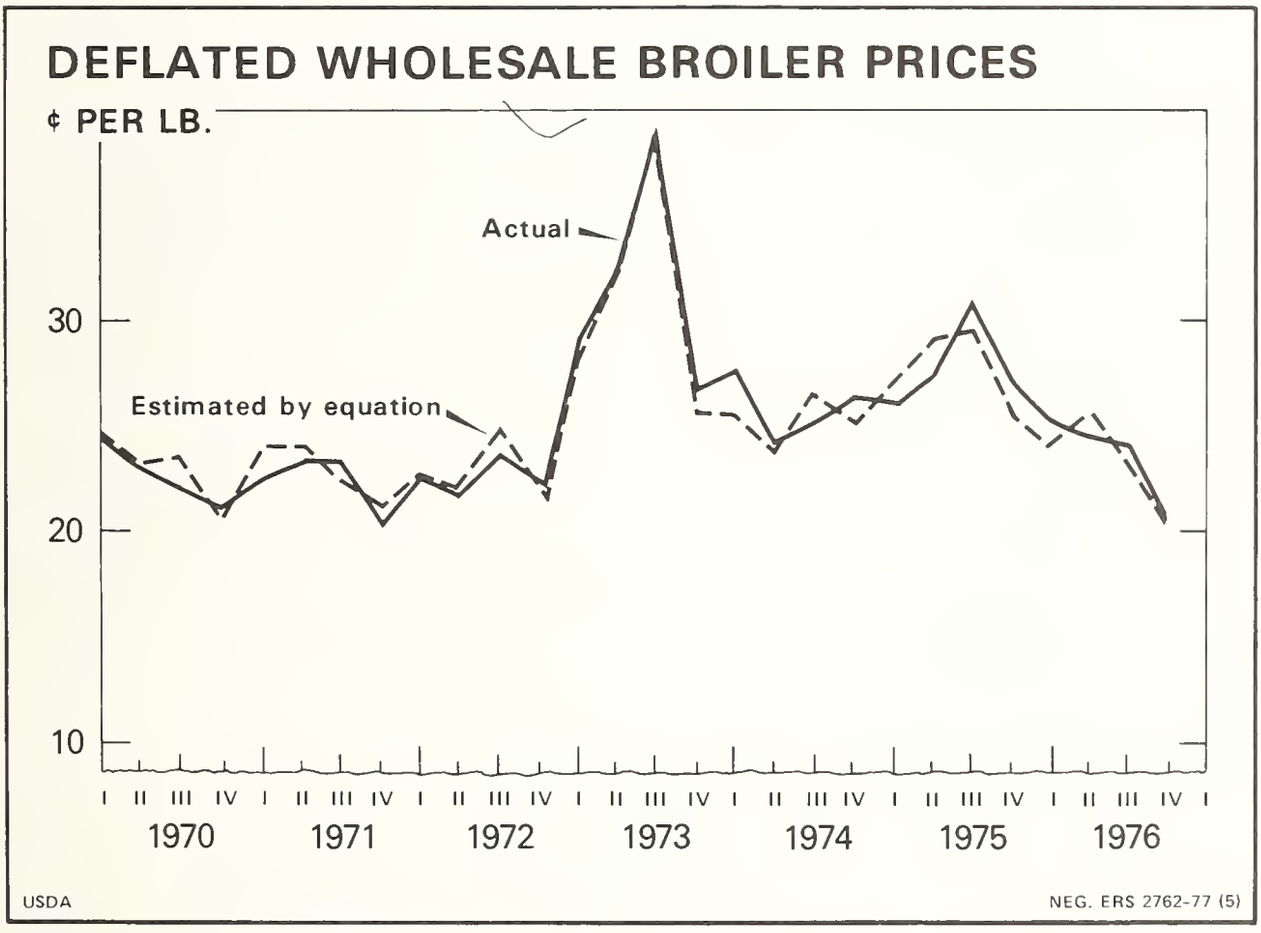
Table 1—Estimated price flexibility coefficients[1]

Quarters	Percentage change in deflated chicken price from a 1 percent change in:				
	Beef and veal (PCAB)	Pork (PCP)	Young chicken (PCYC)	Turkey (PCT*)[2]	Disposable income (RPDI)
I	-.644	-.514	-1.004	--	1.112
II	-.660	-.502	-1.172	--	1.153
III	-.668	-.473	-1.155	--	1.128
IV	-.729	-.585	-1.145	-.553	1.246

[1] Based on a linear estimating equation with quarterly values at the 1960-75 average quarterly levels. [2] Turkey variable only used in fourth quarter.

Other Equations

Many other equations were estimated using different variables and different estimating procedures. Similar equations that were estimated using undeflated broiler prices and disposable income expressed in current dollars had better fits, but they did not do as good a job of predicting broiler prices outside of the period of fit. Other equations were estimated separately for each quarter. Some of these equations were acceptable for the first, second, and fourth quarter. However, no third quarter equation was found to be acceptable.



Changes of Location and Flock Size in Poultry Production

By George B. Rogers and Ruth J. Irvin
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ABSTRACT: For eggs, broilers, and turkeys, regional shares of U.S. output have tended to stabilize in recent years. Substantial declines in numbers of units producing eggs and turkeys occured between 1964 and 1969; there was only a small decline in broiler units. Average sizes increased substantially. Large units account for almost 72 percent of egg production.

KEY WORDS: Poultry production, location, unit numbers, flock sizes.

During the 1950's and until the mid-1960's, substantial shifts occurred among States and regions in the relative importance of egg, broiler, and turkey production. Since the mid-1960's these changes have slowed and regional shares of output have tended to stabilize (table 1). However, geographic concentration of production continues.

The continued commercialization of the egg, broiler, and turkey industries has been reflected in declining numbers of producing units and substantial increases in average output per farm. From 1964 to 1969, the number of farms reporting chicken flocks (mainly laying hens and replacement pullets) declined over 60 percent. Average number of birds per farm increased over 275

Table 1.—Regional shares in production of eggs, broilers, and turkeys, for selected years, 1959-71

Item and region	1959	1964	1967	1969	1971
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
Eggs					
North Atlantic	17	15	14	14	14
East North Central	18	15	14	14	14
West North Central	26	19	16	14	14
South Atlantic	12	17	19	21	21
South Central	14	18	21	21	20
Mountain	2	2	2	2	2
Pacific	11	14	14	14	15
United States	100	100	100	100	100
Broilers					
North Atlantic	9	6	5	6	6
East North Central	5	3	2	2	1
West North Central	3	2	1	1	2
South Atlantic	42	43	43	43	41
South Central	36	42	45	44	46
Mountain	([1])	([1])	([1])	([1])	([1])
Pacific	5	4	4	4	4
United States	100	100	100	100	100
Turkeys					
North Atlantic	4	3	3	3	3
East North Central	16	15	12	12	12
West North Central	34	33	32	30	30
South Atlantic	14	14	15	17	17
South Central	9	12	15	15	16
Mountain	5	5	6	6	6
Pacific	18	18	17	17	16
United States	100	100	100	100	100

[1] Less than 0.05 percent.

Source: Compiled from SRS annual reports, Chicken and Egg Production, Cash Receipts, and Gross Income; Turkeys, Number Raised, Production and Gross Income.

percent. While the number of farms selling broilers and other meat chickens declined about 4 percent, numbers of birds per farm increased over 30 percent. Numbers of farms with turkeys declined sharply, and numbers per farm increased correspondingly (table 2).

Eggs

The pressures from interregional competition have been most evident on eggs. Total production of eggs increased more slowly than population through the mid-1960's as per capita consumption declined.

The shares of egg production from the North Atlantic, East North Central, and West North Central regions declined until the mid-1960's. These shares have now stabilized at 14 percent for each of the 3 regions.

The South Atlantic, South Central, and Western regions increased their shares of U.S. egg production until the mid-1960's. In recent years, the South Atlantic and South Central regions combined have accounted for 41 percent of output, and the Western region for 17 percent.

Major increases in egg production during the 1960's occurred in North and South Carolina, Georgia, Alabama, Mississippi, Arkansas, Florida, Tennessee, Texas, California, Maine, and New York. Declines occurred in other leading States such as Iowa, Minnesota, Wisconsin, Ohio, Michigan, Missouri, Nebraska, Illinois, and Pennsylvania. Generally, States which have been expanding tend to have more of the concentrated pockets of production than other States (figure 1).

Average flock sizes increased in all regions from 1964 to 1969, with the largest relative increases in the South Atlantic, South Central, and Pacific regions. Flock numbers also declined relatively more in those same regions than elsewhere. Nationwide, flocks of 10,000 or more birds accounted for only 1.9 percent of the farms but 71.6 percent of the birds in 1969, compared with 0.5 and 41.0 percent, respectively in 1964. The Western region had 91 percent of its birds in flocks of 10,000 or more in 1969, the South 78 percent, the North Atlantic region 72 percent, and the North Central region 47 percent (table 3).

Table 2.—Chickens on farms, broilers sold and turkeys raised and sold, 1964 and 1969

Item and region	1964		1969	
	Farms reporting	Average per farm	Farms reporting	Average per farm
	Number	*Number*	*Number*	*Number*
Chickens on farms[1]				
North Atlantic	56,493	913	23,843	2,056
East North Central	176,298	292	75,259	636
West North Central	308,858	205	133,284	319
South Atlantic	194,063	304	63,627	1,311
South Central	400,121	165	143,977	595
Mountain	42,795	155	18,945	386
Pacific	31,360	1,404	12,138	4,451
United States (48)	1,209,988	283	471,073	785
Broilers or other meat-type chickens sold				
North Atlantic	2,446	46,267	1,836	61,961
East North Central	1,240	33,194	1,667	18,556
West North Central	875	44,330	2,764	8,277
South Atlantic	15,621	50,724	12,828	79,570
South Central	14,064	60,133	13,656	83,274
Mountain	103	58,015	240	15,520
Pacific	730	105,208	723	137,110
United States (48)	35,079	54,561	33,714	72,028
Turkeys raised[2]				
North Atlantic	2,091	1,583	544	5,304
East North Central	3,109	5,530	936	15,307
West North Central	8,054	4,186	1,624	18,862
South Atlantic	6,232	2,493	708	24,826
South Central	17,802	685	872	17,708
Mountain	2,575	2,071	296	19,662
Pacific	1,963	8,895	444	37,774
United States (48)	41,826	2,504	5,424	19,074

[1] 1964, chickens 4 months old and over; 1969, chickens 3 months old or over. [2] 1964, turkeys raised on farms; 1969, sold on farms with sales of $2500 and over.

Source: State Census reports, 1964 and 1969.

Table 3.—Regional distribution of farms reporting chickens on hand and proportion of birds, by size intervals, 1964 and 1969

Flock size interval and region	1964		1969	
	Chickens on hand, 4 months old and over		Chicken on hand, 3 months old and over	
	Percent of farms	*Percent of birds*	*Percent of farms*	*Percent of birds*
North Atlantic[1]				
Under 100	57.6	1.9	53.2	.8
100-3199	35.6	24.9	35.6	10.9
3200-9999	4.9	29.3	5.9	16.7
10,000 and over	1.9	43.9	5.3	71.6
North Central[2]				
Under 100	52.4	7.9	55.7	4.6
100-3199	46.7	61.6	43.0	29.5
3200-9999	.7	15.2	1.4	18.9
10,000 and over	.2	15.3	.9	47.0
South[3]				
Under 100	92.0	10.7	88.2	2.7
100-3199	6.7	13.7	7.5	3.9
3200-9999	.9	25.4	2.1	15.8
10,000 and over	.4	50.2	2.2	77.6
Western[4]				
Under 100	84.6	3.2	83.4	1.1
100-3199	12.0	8.6	11.4	2.5
3200-9999	1.6	14.7	1.7	5.1
10,000 and over	1.8	73.5	3.5	91.3
48. States[5]				
Under 100	73.7	7.3	71.7	2.7
100-3199	24.7	30.7	24.4	10.8
3200-9999	1.1	21.0	2.0	14.9
10,000 and over	.5	41.0	1.9	71.6

[1] New England and Middle Atlantic. [2] East and West North Central. [3] South Atlantic, East and West South Central. [4] Mountain and Pacific. [5] Excludes Hawaii and Alaska.

Source: State Census reports, 1964 and 1969.

Broilers

Production of broilers rose steadily from 1960 to 1971 at a higher rate than population. Hence, per capita consumption continued to trend upward. For broilers, as for turkeys, this has softened the effects from interregional competition.

The shares of output have tended to level off since the mid-1960's. In recent years, the South Atlantic and South Central regions combined have accounted for 87 percent of output, the North Atlantic region for 6 percent, and the North Central and Western regions for around 4 percent each.

Major increases in broiler production during the 1960's occurred in most of the States in the South. Output also expanded in certain States in other regions, such as Maine, Pennsylvania, California, Oregon, Washington, and Minnesota. Declines occurred in other important States such as Missouri, Wisconsin, Indiana, Ohio, and West Virginia. Concentrated pockets of production are most evident in such States as Arkansas, Georgia, North Carolina, Mississippi, Alabama, Texas, Maine, California, Pennsylvania, Delaware, Maryland, and Virginia (figure 2).

Average flock sizes increased in the major broiler producing regions (the South, North Atlantic, and Pacific areas) from 1964 to 1969. Numbers of flocks declines in these same areas. In the North Central and Mountain regions, flock numbers increased and average flock size declined.

Turkeys

Per capita consumption of turkey rose between 1960 and 1971, with production trending irregularly upward.

Since the mid-1960's the shares of national output from various regions have leveled off. The West North Central region, the single most important area, accounts for 30 percent. The South Atlantic region provides 17 percent and the South Central and Pacific regions 16 percent each. The East North Central, Mountain, and the North Atlantic regions make up the balance.

The sharpest rates of increase in turkey output since 1960 have been in North and South Carolina, Georgia, Arkansas, Texas, and Missouri. Lesser rates of increase have occurred in Minnesota and California - by far the most important States and in several other States of the

Midwest, West, South, and Northeast. Declines have occurred in such important States as Iowa, Virginia, and Wisconsin. Since turkey production is more of a land-based enterprise in most States than egg or broiler production, concentrated pockets of production are less evident. But there are concentrations in many areas, including such major States and Minnesota, California, Arkansas, Texas, Missouri, North Carolina, Virginia, Indiana, Iowa, Ohio, Utah, Wisconsin, South Carolina, and Georgia (figure 3).

Because the 1964 and 1969 data series for farm numbers and turkey flock sizes are not strictly comparable, changes in these measures are not readily evident. However these data do indicate that it is likely that farm numbers declined and average numbers per farm increased substantially over the 5-year period.

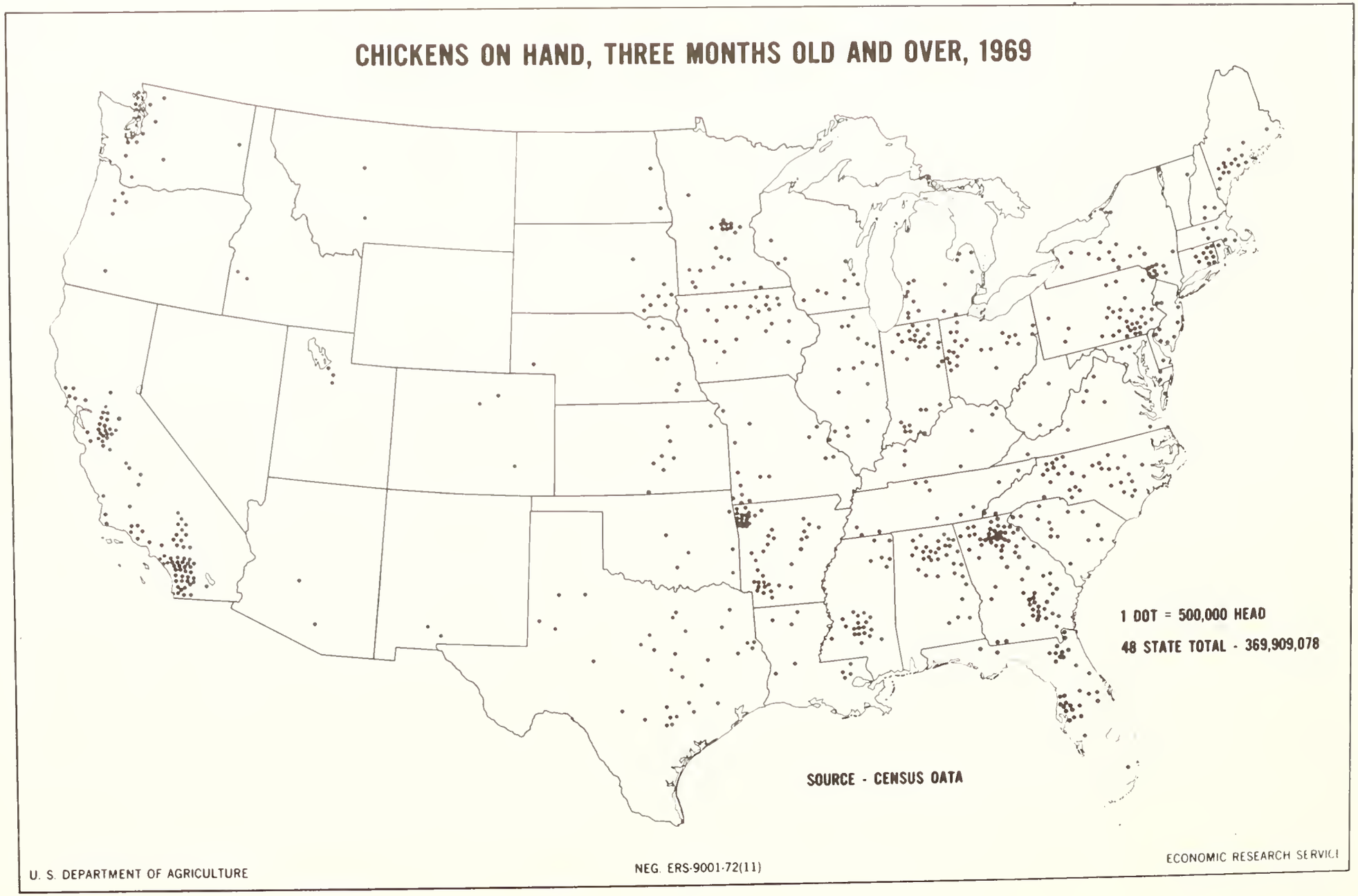
CHICKENS ON HAND, THREE MONTHS OLD AND OVER, 1969
1 DOT = 500,000 HEAD
48 STATE TOTAL - 369,909,078
SOURCE - CENSUS DATA
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS-9001-72(11)
ECONOMIC RESEARCH SERVICE

Figure 1

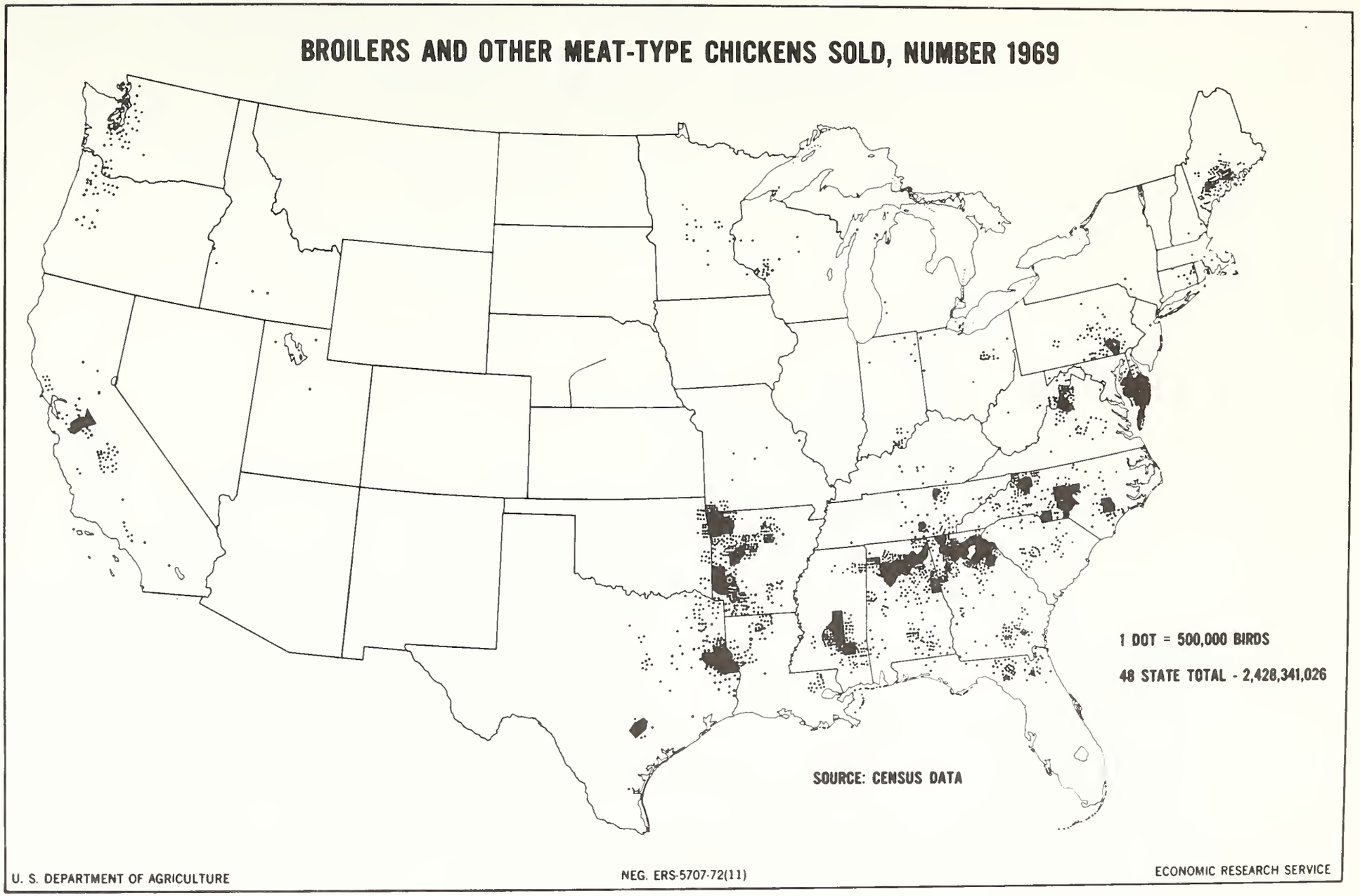
BROILERS AND OTHER MEAT-TYPE CHICKENS SOLD, NUMBER 1969
1 DOT = 500,000 BIRDS
48 STATE TOTAL - 2,428,341,026
SOURCE: CENSUS DATA
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS-5707-72(11)
ECONOMIC RESEARCH SERVICE

Figure 2

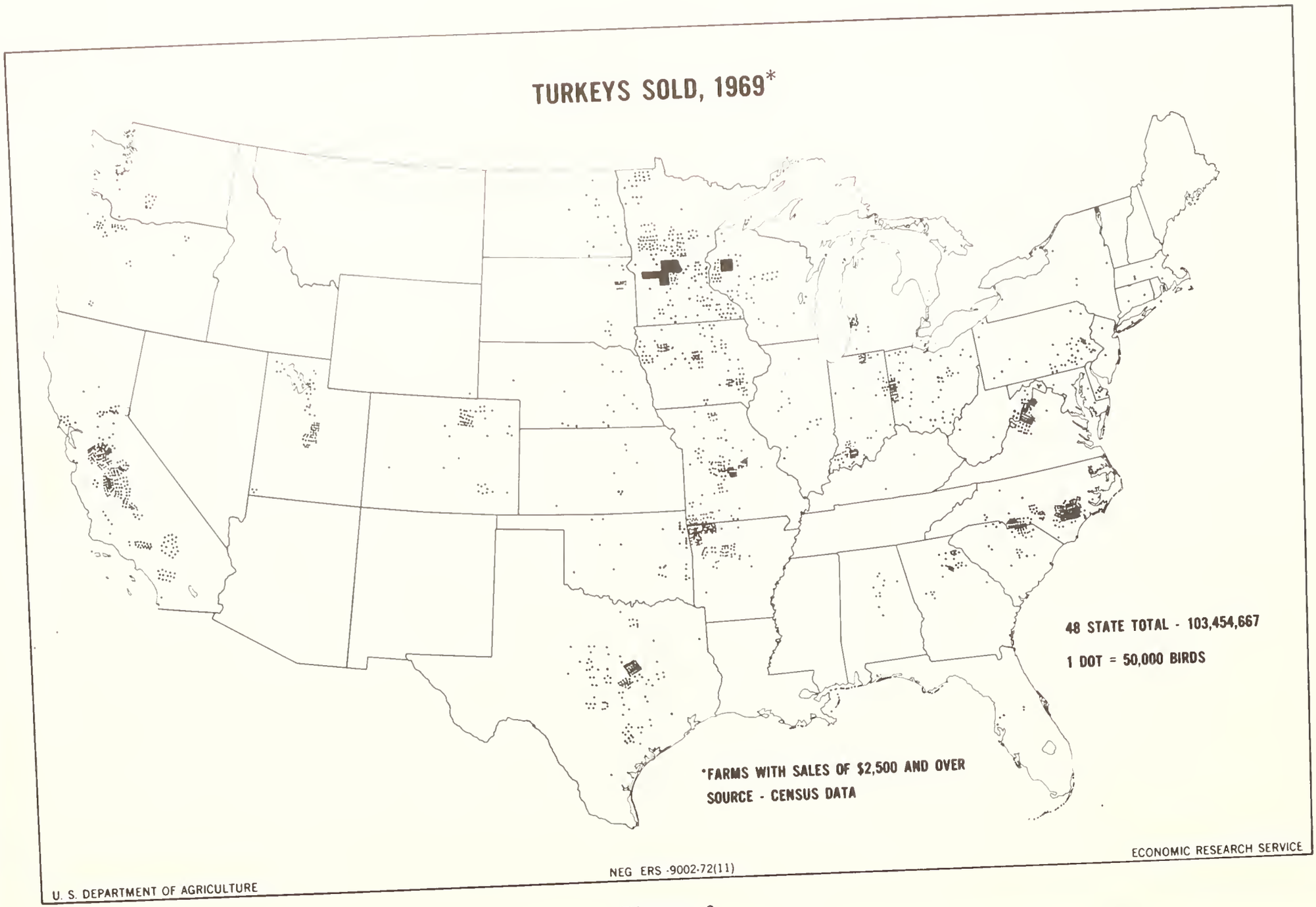
TURKEYS SOLD, 1969*
48 STATE TOTAL - 103,454,667
1 DOT = 50,000 BIRDS
*FARMS WITH SALES OF $2,500 AND OVER
SOURCE - CENSUS DATA
ECONOMIC RESEARCH SERVICE
NEG ERS -9002-72(11)
U. S. DEPARTMENT OF AGRICULTURE

Figure 3

INTERREGIONAL MOVEMENTS OF EGG AND POULTRY PRODUCTS, 1955-73

by

George B. Rogers and Ruth J. Irvin
Commodity Economics Division

ABSTRACT: Interregional movements of markets egg and poultry products have changed substantially since the mid-1950's. Shifts in the surplus-deficit status of various regions and in the emphasis each region places on shell eggs and ready-to-cook poultry vs. further-processed products account for many of the changes. Data used as the basis for this article also recognize quality and size distribution differences between regions, seasonal movements, and historical precedents as they affect interregional movements.

KEY WORDS: Egg, Chickens, Turkeys, Product Form, Interregional Movements, Marketing.

INTRODUCTION

Surplus-deficit tables and maps have been presented in Federal and State publications for many years. These typically were based on the differences between total production and total consumption (on a uniform per capita basis) in States and regions. The deduction of inter-area movements from such net calculations can be, at best, oversimplified and indicative of only major directions of movements.

One reason is that movements of shell eggs or ready-to-cook poultry may be considerably different from movements of further-processed products. Some regions produce a much larger or smaller share of U.S. output of further-processed products than of shell eggs or ready-to-cook poultry. Where this occurs, interregional movements of the two classes or products can vary widely.

As some regions change from surplus to deficit, or deficit to surplus, interregional movement patterns can be drastically altered. Even major changes in the degree of surplus or deficit can have similar results. Many changes of these types have occurred in the egg and poultry industries over the past two decades.

Many previous studies of interregional competition have treated output as if it were all of one type of quality, and determined least-cost patterns of movements on the total. But birds of different sizes and eggs of different qualities are not produced in the same proportions in every region. Moreover, some interregional movements occur because of established business relationships, and political boundaries may not be consistent with geographic locations of producing area and associated consuming centers. And some movements occur to fill seasonal shortages. Finally, exogeneous events can sharply change movements in a particular year, and sometimes such changes persist for several years thereafter.

The study derives improved estimates of principal interregional movements by product form, and recognizes factors which cause variations from the total surplus-deficit approach. While the additional information obtained is an improvement over previous results, some distortions between estimates and actual movements probably remain, due in part to regional differences in per capita consumption. But no annual series are available to permit this further refinement. Commodities covered in the study were eggs, turkeys, broilers, and other chickens. Regions used were: New England, Middle Atlantic, South Atlantic, South Central, East North Central, West North Central, Mountain and Pacific, as defined in farm Census classifications and most USDA statistical compilations.

Most regions use a large share of their local production to satisfy regional needs. However, some deficit regions may supply markets in other regions. And some surplus regions may receive supplies of some products from other surplus (or even deficit) regions. For summary purposes, discussions have been grouped into three time periods: the late 1950's to the early 1960's, the early to mid-1960's, and the period since the mid-1960's. Movements in addition to those enumerated

probably do occur, but could not be consistently identified from data sources and previous studies.

Market Eggs

During the mid-1950's to early 1960's, the West North Central region was the major surplus area for both shell eggs (excludes eggs for hatchery use) and egg products. Hence, the principal interregional movements were from the West North Central region. Since that region had the bulk of egg breaking capacity, some surplus breaking eggs moved into the West North Central region from the South and West. Small and similar movements occurred from the Northeast to the East North Central region, and shell eggs and egg products moved in the opposite direction. The Pacific region sent some shell eggs to the Mountain and South Central regions. Some shell eggs moved from New England to the Middle Atlantic region.

During the early to mid-1960's, growing surpluses fo shell eggs appeared in the South Atlantic, South Central, and Pacific regions. Shell eggs moved in increasing volumes from the South toward to the north and northeast. The Pacific region increased shell egg shipments to the Mountain region and the Southwest. Movements in both directions between the Northeast and the East North Central region continued, as did the movement from New England to the Middle Atlantic region. The West North Central region's surplus declined, and it no longer shipped shell eggs in volume toward the south, and its share of shell egg markets in other regions declined. Both the West North Central region remained the pricipal producer of egg products, supplying important quantities to other regions, and receiving surplus breaking stock from the South and West.

After the mid-1960's the West North Central region lost further ground as a supplier of shell eggs to regions to the east and west. With the rapid growth of breaking capacity in the Northeast, South, and West, movements of egg products from the West North Central region also declined. Some shell eggs entered markets in the West North Central region from the South and West. Movements of eggs from the East North Central region to the Northeast declined, and some movement from New England to the Middle Atlantic region was maintained. The South became a more important supplier to areas to the north and northeast, while the Pacific region remained an important supplier to the Mountain region and the Southwest.

The proportion of eggs being used in processed form has trended gradually upward from over 7 percent in the mid-1950's to about 12 percent in the last few years.

Turkeys

During the mid-1950's to early 1960's, the West North Central, Mountain, and Pacific regions were the main surplus areas for ready-to-cook heavy turkeys. The West North Central region supplied regions to the east and south. Some heavy turkeys also moved from the East North Central region to the Northeast. The Mountain and Pacific regions shipped to the south, Northeast, and East North Central areas. Some small turkeys also moved westward from the West North Central regions, and north, Northeastward, and to the South Central region from the South Atlantic region. The West North Central region, as the main producer of further-processed turkey products, shipped to all other regions, while the Pacific region began shipping to the Mountain region and the Southwest. Small quantities of ready-to-cook turkeys from the West North Central, Mountain, and Pacific regions also entered the Middle Atlantic region for further processing.

In the early to mid-1960's most of the earlier movements of ready-to-cook turkeys continued. Increased quantities of ready-to-cook turkeys from the West North Central, Mountain, and Pacific regions entered the Middle Atlantic region for further processing as that region expanded its capacity to supply regional needs. With the development of a surplus of further-processed products, the South Atlantic region entered markets in the New England and Middle Atlantic regions. The Pacific region supplied increased quantities of further processed products to the Mountain and South Central regions. West North Central region shipments of further-processed products now went towards the east and south.

After the mid-1960's surpluses of ready-to-cook heavy turkeys developed in the South Atlantic and South Central regions. Supplies from both regions moved to the East North Central region, and from the South Atlantic region to New England and the MIddle Atlantic region. Previous movements of small ready-to-cook turkeys continued. Movements of ready-to-cook heavy turkeys from the West North Central region went mainly to the Northeast and East North Central areas, as did those from the Mountain and Pacific regions. The West North Central region again shipped further-processed products to all other regions. The south Atlantic region continued shipments to the New England and Middle Atlantic regions, while the Pacific region shipped for a few years to the Mountain region until the Pacific region itself became deficit in further-processed products. Increased quantities of ready-to-cook turkeys from the West North· Central, Mountain, and Pacific regions moved to the Middle Atlantic and New England regions for further processing in those regions.

The proportion of total turkey output used in further processing trended upward from about 5 percent in the mid-1950's to about 34 percent in recent years.

Broilers

Since 1955 the South Atlantic and South Central regions have remained surplus producers of ready-to-cook broilers, shipping to all other regions

except New England over the entire period. New England had a surplus of ready-to-cook broilers from the mid-1950's to early 1960's and these went to the Middle Atlantic region. Since that time, the New England region's deficit has been met by shipments from the South Atlantic region.

Until the mid-1960's, the West North Central region supplied further-processed products to the Middle Atlantic and East North Central regions. and after that time to the East North Central region. The West North Central region has, since 1955, obtained ready-to-cook broilers for further processing from the South Atlantic and South Central regions. Until the mid-1960's, the South Atlantic region shipped further-processed products to the New England, Middle Atlantic, East North Central, Mountain and Pacific regions, Since that time, it has not shipped either further-processed or ready-to-cook broilers as farm westward in the quantities it once did. The South Central region has shipped further-processed products to the East North Central, Mountain, and Pacific regions since the mid to late 1950's. In recent years, the Middle Atlantic region has obtained ready-to-cook broilers from the South for further processing and supplies small quantities of further-processed products to New England. Ready-to-cook broilers have continued to move to the Middle Atlantic region since the mid-1960's from New England despite that region's deficit status.

The proportion of total broiler output used in further processing remained rather small for many years. But it trended upward from less than 1 percent in the mid-1950's to over 5 percent in recent years, with the rate of increase greatest since the mid-1960's.

Other Chickens

Since 1955, the New England region has produced a small surplus of ready-to-cook birds, mainly for the Middle Atlantic region. In the late 1950's to early 1960's, the South Atlantic region developed small surpluses of both ready-to-cook birds and further-processed products to ship to the Middle Atlantic region. Late in this period, the South Central region began sending a ready-to-cook surplus to the East North Central region, and the Pacific region began shipping to the Mountain, East North Central, and Middle Atlantic regions. Some ready-to-cook birds also moved from the East North Central region to the Middle Atlantic region. In these earlier years, the West North Central region supplied ready-to-cook birds to the Middle Atlantic and East North Central regions, and further-processed products to all regions.

By the early to mid-1960's, the West North Central Region was supplying ready-to-cook birds to the East North Central regions, and further-processed products to all regions except the South Atlantic region. The South Atlantic region has widened its markets for further-processed products to include both the Middle Atlantic and East North Central regions. Growing surpluses of ready-to-cook birds in the South Atlantic and South Central regions were moving to the Middle Atlantic, East North Central, and West North Central regions, including growing quantities for further processing within those regions of destination. The Pacific region also sent ready-to-cook birds to the Mountain, West North Central, East North Central, and Middle Atlantic regions, including growing quantities for further processing within the latter three regions.

By the late 1960's, the West North Central region was important only as a supplier of further-processed products to all regions except the South Atlantic region. The South Atlantic region shipped further-processed products to the New England, Middle Atlantic, and East North Central regions. The South Atlantic and South Central regions were shipping increased quantities of ready-to-cook birds to the Middle Atlantic, East North Central, and West North Central regions, including sizable quantities for further-processing within the latter region. As the Pacific region's surplus of ready-to-cook birds declined, it shipped smaller amounts to the Mountain and West North Central regions, including some for further processing within the latter region. In 1972-73, the output of other chickens in the Pacific region was sharply reduced by the liquidation of Southern California flocks under the Newcastle disease eradication program, and the Pacific region actually became deficit in mature chickens.

The total supply of other chickens has decreased since 1955, with per capita consumption declining substantially in contrast to the upward trends in per capita broiler and turkey consumption. The declining supply of other chickens is a result of several forces. Among these are an increased rate of lay per hen, requiring fewer birds to produce a given quantity of eggs and a shift from frozen poultry to fresh young chickens. The proportion of the total supply of other chickens used in further processing has risen from under 15 percent in the mid-1950's to close to 60 percent in recent years. The proportion of fowl, particularly from market egg-type birds, used in further processing is much higher than the ratios for all other chickens.

CHANGES IN REGIONAL SELF-SUFFICIENCY IN EGG AND POULTRY SUPPLIES, 1955-75

by
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ABSTRACT: Substantial changes in both total production and regional distribution of poultry and egg products have occurred in the last two decades. Different rates of regional growth in further-processed product production have also occurred. At the same time, changing distributions of consuming populations, by regions, have affected total needs. Consequently, there have been major regional changes in surplus-deficit positions as well as interregional product movements. These have had varying effects on aggregate long-distance transportation costs for eggs and poultry.

KEYWORDS: Eggs, chickens, turkeys, product form, consumption, interregional movements.

Over the last two decades, the shares of the total U.S. egg supply coming from the South Atlantic, South Central, Pacific, and New England regions have increased whle the shares of other regions have generally declined. For turkeys, the shares of only the West North Central, South Atlantic, South Central, and Mountain regions have remained steady or increased. For young chickens, the share of the South Atlantic region remained steady, while that of the South Central region increased, For mature chickens, only the shares of the South Atlantic and South Central regions consistently increased.

During the same period, shares of total U.S. population in the South Atlantic and Pacific regions increased. The share of the South Central region remained steady with the shares of other regions declining. These relative shifts in supplies and population affected the pattern of and need for interregional movements of egg and poultry products.

But since eggs and poultry are not homogeneous products, interregional movements also occur for reasons other than balancing out total regional surplus-deficit positions. One such reason is the different patterns of regional production of shell eggs and ready-to-cook poultry versus the processed forms. Another is to meet the needs for different qualities of eggs or sizes of poultry. Other movements also occur for institutional reasons.

A region may be surplus in a product but may not be able to supply all it needs because of the movement of its product to other regions. Consequently, for this analysis, surplus does not necessarily indicate self-sufficiency.

The following summaries indicate major changes in regional self-sufficiency status sincethe mid-1950's.

Eggs

For shell eggs, the South Atlantic, South Central, Pacific, and New England regions became essentially self-sufficient. The Middle Atlantic, East North Central, West North Central, and Mountain regions became somewhat more dependent on outside supplies. For the latter two regions, a slight reversal of this trend may now be occurring.

For processed eggs, only the West North Central region is surplus, but by a declining amount. Particularly in the last decade, all other regions have tended to produce a larger share of their needs.

Shifts in surplus-deficit positions of various regions resulted in only a slight reduction in aggregate (deflated) long-distance transportation costs on shell eggs (table 1), but a one-third reduction in such costs occurred on processed eggs.

Table 1—Eggs: Measures of the degree of self-sufficiency, by regions, selected years

Year and measure	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	Mountain	Pacific
Total regional supply as percent of total regional consumption[1]								
1955	75	71	97	318	59	73	73	94
1960	72	65	89	296	81	83	63	105
1965	77	60	77	230	107	110	52	117
1970	80	53	73	169	129	125	54	125
1975	96	55	73	160	126	116	58	129
Shell eggs: regional supply as percent of regional consumption[2]								
1955	81	76	98	277	63	78	77	100
1960	79	70	90	244	87	89	67	113
1965	84	64	78	179	112	117	56	123
1970	88	55	73	123	136	130	59	131
1975	104	53	72	137	134	120	64	129
Processed eggs: regional production[3] as percent of regional consumption								
1955	3	7	81	833	18	16	20	11
1960	5	8	79	844	21	19	13	26
1965	9	13	74	726	56	44	8	57
1970	21	38	67	548	71	82	12	79
1975	31	74	82	343	69	86	18	130
Shell eggs: percent of regional consumption met from regional supplies[4]								
1955	76	76	91	94	62	76	77	96
1960	74	70	85	94	86	88	67	99
1965	79	64	77	92	100	94	56	99
1970	83	55	69	74	100	93	59	99
1975	96	53	69	77	100	93	64	99
Processed eggs: percent of regional consumption met from regional supplies[4]								
1955	3	7	46	100	18	16	20	11
1960	5	8	45	100	21	19	13	26
1965	9	13	41	100	56	44	8	57
1970	21	38	43	100	71	82	12	79
1975	31	74	65	100	69	86	18	100

[1] Derived from total surplus-deficit series for all eggs. [2] Does not reflect interregional movements. [3] Includes production from regional supply as well as production from receipts from other regions. [4] The quantity of shipments to other regions is removed from regional supply.

Turkeys

For ready-to-cook turkeys, the New England, Middle Atlantic, and East North Central regions became more deficit. The South Atlantic and South Central regions became surplus and essentially self-sufficient. The West North Central and Pacific regions remained surplus, but by less, and the Mountain region's surplus grew. The latter two regions are essentially self-sufficient on most sizes of turkeys.

For further-processed turkeys, the West North Central region remained, and the South Atlantic and Pacific regions became surplus and self-sufficient. Other regions remained deficit and dependent on outside supplies to varying degrees.

The preceding shifts in surplus-deficit positions of various regions did not change aggregate (deflated) long-distance transportation costs on ready-to-cook turkeys much (table 2). But such costs on further-processed turkeys declined about a fourth.

Young Chickens

For ready-to-cook young chickens, only the South Atlantic and South Central regions are surplus and self-sufficient. Other regions have generally become more dependent on outside supplies.

For further-processed young chickens, the South Atlantic and South Central regions are surplus and self-sufficient. The Middle Atlantic region became surplus on production, but does not supply all its needs due to movements to other regions.

The preceding shifts in surplus-deficit positions resulted in an increase of a tenth in aggregate (deflated) long-distance transportation costs on ready-to-cook young chickens (table 3). But, such costs on the further-processed form declined about a fifth.

Table 2—Turkeys: Measures of the degree of self-sufficiency, by regions, selected years

Year and measure	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	Mountain	Pacific
Total regional supply as percent of regional consumption[1]								
1955	38	27	66	308	95	60	179	203
1960	18	17	72	399	58	66	164	187
1965	11	14	74	397	83	84	142	145
1970	6	13	63	360	113	100	160	128
1975	3	15	59	384	126	88	156	112
Ready-to-cook: regional supply as percent of regional consumption[2]								
1955	40	28	68	269	101	63	189	213
1960	19	17	72	381	59	72	183	190
1965	13	14	79	401	79	93	172	142
1970	6	13	61	297	118	117	208	143
1975	4	17	60	236	149	129	265	121
Further-processed: regional production[3] as percent of regional consumption								
1955	4	4	29	1,004	0	0	0	28
1960	10	54	69	557	48	12	0	157
1965	4	87	51	380	99	48	4	158
1970	17	44	68	507	100	60	3	93
1975	2	41	58	522	104	50	55	112
Ready-to-cook: percent of regional consumption met from regional supplies[4]								
1955	40	28	61	100	78	63	100	94
1960	19	17	66	100	48	72	96	97
1965	13	14	73	100	65	93	94	97
1970	6	13	56	100	100	93	94	93
1975	4	17	52	100	100	90	95	92
Further-processed: percent of regional consumption met from regional supplies[4]								
1955	4	4	29	100	0	0	0	28
1960	10	17	69	100	48	12	0	100
1965	4	14	51	100	91	48	4	100
1970	6	13	68	100	95	60	3	93
1975	2	13	58	100	100	50	55	100

[1] Derived from total surplus-deficit series for all turkeys. [2] Does not reflect interregional movements. [3] Includes production from regional supplies as well as production from receipts from other regions. [4] The quantity of shipments to other regions is removed from regional supply.

Mature Chickens

For ready-to-cook mature chickens, the South Atlantic and South Central regions became more surplus and self-sufficient. The East and West North Central and Pacific regions went from surplus to deficit.

For further-processed mature chickens, only the West North Central and South Atlantic regions remained surplus, with the latter the only self-sufficient region. Some other regions became more self-sufficient.

The preceding shifts in surplus-deficit positions (table 4) resulted in almost a doubling of aggregate (deflated) long-distance transportation costs on ready-to-cook mature chickens. But such costs declined about a quarter on the further-processed form.

Table 3—Young chickens: Measures of the degree of self-sufficiency, by regions, selected years

Year and measure	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	Mountain	Pacific
Total regional supply as percent of total regional consumption[1]								
1955	151	28	36	39	302	155	14	56
1960	99	18	23	30	300	213	11	41
1965	75	13	11	23	287	271	8	35
1970	56	12	7	18	278	282	7	35
1975	53	14	7	19	261	279	0	37
Ready-to-cook: regional supply as percent of total regional consumption[2]								
1955	152	28	36	39	302	155	14	57
1960	101	18	23	30	302	214	11	42
1965	76	13	11	23	289	263	9	34
1970	56	12	7	18	282	287	7	35
1975	54	14	7	19	266	285	0	37
Further-processed: regional production[3] as percent of regional consumption								
1955	23	6	5	112	389	185	0	10
1960	41	16	20	290	233	182	0	18
1965	42	38	45	252	178	196	0	24
1970	43	90	16	135	199	195	2	45
1975	41	135	35	64	177	180	4	36
Ready-to-cook: percent of regional consumption met from regional supplies[4]								
1955	100	28	36	39	100	100	14	57
1960	64	18	23	30	100	100	11	42
1965	46	13	11	23	100	100	9	34
1970	38	12	7	18	100	100	7	35
1975	38	14	7	19	100	100	0	37
Further-processed: percent of regional consumption met from regional supplies[4]								
1955	23	6	5	39	100	100	0	10
1960	41	16	20	30	100	100	0	18
1965	42	13	11	23	100	100	0	24
1970	43	12	7	18	100	100	2	35
1975	41	16	8	22	100	100	0	36

[1] Derived from total surplus-deficit series for all young chickens. [2] Does not reflect interregional movements. [3] Includes production from regional supplies as well as production from receipts from other regions. [4] The quantity of shipments to other regions is removed from regional supply.

Table 4—Mature chickens: Measures of the degree of self-sufficiency, by regions, selected years

Year and measure	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	Mountain	Pacific
Total regional supply as percent of regional consumption[1]								
1955	123	60	103	315	71	68	72	73
1960	121	51	75	297	106	95	58	98
1965	104	49	62	193	146	136	42	92
1970	85	45	65	160	159	158	40	80
1975	122	40	63	163	154	163	45	62
Ready-to-cook: regional supply as percent of regional consumption[2]								
1955	142	66	113	218	78	79	84	82
1960	160	57	79	164	107	106	77	123
1965	176	49	62	52	164	214	73	126
1970	156	45	66	61	164	305	90	138
1975	253	40	72	54	140	277	96	74
Further-processed: regional production[3] as percent of regional consumption								
1955	2	15	34	948	28	0	0	10
1960	4	35	64	697	103	12	0	26
1965	8	64	81	509	123	34	1	47
1970	31	63	64	479	154	45	1	36
1975	7	50	54	472	165	63	([5])	52
Ready-to-cook: percent of regional consumption met from regional supplies[4]								
1955	100	66	100	100	78	79	84	82
1960	100	57	79	100	100	100	77	100
1965	100	49	62	52	100	100	73	100
1970	100	45	66	61	100	100	90	100
1975	100	40	72	54	100	100	96	74
Further-processed: percent of regional consumption met from regional supplies[4]								
1955	2	15	34	100	28	0	0	10
1960	4	35	64	100	100	12	0	26
1965	8	49	62	57	100	34	1	47
1970	31	44	64	47	100	45	1	36
1975	7	39	54	47	100	63	([5])	52

[1] Derived from total surplus-deficit series for all mature chickens. [2] Does not reflect interregional movements. [3] Includes production from regional supplies as well as production from receipts from other regions. [4] The quantity of shipments to other regions is removed from regional supply. [5] Less than ½ to 1 percent.

TYPES OF PACKS AND PRODUCT FORMS PRODUCED BY FEDERALLY INSPECTED POULTRY PLANTS, 1973-75

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ABSTRACT: Slaughtering plants account for substantial shares of total output of cut-up and further-processed chickens and turkeys, and virtually all of the frozen packs. However, the number of non-slaughtering plants engaged in cutting-up and further-processing may be many times larger than the number of slaughtering plants performing these functions. Nationally, cutting-up is most important for young chickens, less so for turkeys, and minor for mature chickens. Further-processing is the major use of mature chickens, and is very important for turkeys, but relatively small for young chickens. At the slaughtering plant level, frozen packs predominate for turkeys and fresh packs for chickens.

KEYWORDS: Chickens, turkeys, packs, products, plant numbers.

Along with the growth in total output of poultry meat, changes have occurred in the relative importance of the various functions performed by slaughtering and non-slaughtering plants. Poultry slaughtering plants have become the major producers of frozen poultry, produce substantial shares of further-processed items, and produce the bulk of cut-up young chickens.

The accompanying tables contain regional comparisons of the relative importance for 1973-75 of federally inspected slaughtering and non-slaughtering plants in the production of various types of packs and product forms during 1973-75 and provide recent estimates of the numbers of plants involved. Comparisons are approximations since Federal inspection data categories are not completely exclusive and include interregional movements. There are pronounced regional variations in functions performed.

Federally inspected poultry processing plants account for more than 95 percent of the total number of chickens and turkeys produced. More than 1700 such plants were engaged in some type of poultry processing in 1973-75. Many of these plants performed more than one processing activity or processed more than one market class of chickens or turkeys.

Young Chickens

Nearly all of the U.S. output of federally inspected plants was fresh packs. Nationally, slaughtering plants produced nearly three-fourths of their volume as whole RTC (ready-to-cook) birds, and nearly one-fourth as cut-up. For all plants, whole RTC birds accounted for more than three-fifths, cut-up for over three-tenths, and further-processed for about 6 percent (table 1).

There were nearly three times as many non-slaughtering plants cutting up young chickens as slaughtering plants performing that function, and over 7 times as many non-slaughtering plants producing further-processed. However, slaughtering plants (263) accounted for virtually all frozen packs, almost 80 percent of the cut-up volume, and almost 40 percent of the further-processed output. Hence, volume of such items produced per slaughtering plant was much larger than the average output of non-slaughtering plants (tables 2 and 3).

Table 1—Regional percentages of chicken and turkey meat output in slaughtering plants and all plants, by pack and product form, 1973-75

Pack type and	Slaughtering plants[3]					All plants[4]
	Northeast	Midwest	South	West	U.S.	U.S.[5]
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
			Young Chickens			
Type of pack:						
Fresh[1]	93.8	94.3	91.6	99.8	92.1	92.1
Frozen	6.2	5.7	8.4	0.2	7.9	7.9
Product form:						
Whole RTC[2]	54.8	74.3	75.4	62.6	73.5	62.7
Cut-up	35.6	23.5	22.6	37.3	24.1	30.9
Further-processed	9.6	2.2	2.0	0.1	2.4	6.4
			Mature Chickens			
Type of pack:						
Fresh[1]	95.3	91.9	78.8	50.4	81.8	81.8
Frozen	4.7	8.1	21.2	49.6	18.2	18.2
Product form:						
Whole RTC[2]	84.9	45.4	85.4	82.7	73.7	17.3
Cut-up	0.0	0.4	0.3	3.4	0.6	1.4
Further-processed	15.1	54.2	14.3	13.9	25.7	81.3
			Turkeys			
Type of pack:						
Fresh	33.8	23.9	14.4	15.8	19.4	18.7
Frozen	66.2	76.1	85.6	84.2	80.6	81.3
Product form:						
Whole RTC[2]	75.0	43.4	57.3	54.2	51.2	35.3
Cut-up	4.0	12.4	16.0	16.5	14.2	16.4
Further-processed						
Whole bird	3.1	25.5	15.1	17.1	19.8	20.1
Other	17.9	18.7	11.6	12.2	14.8	28.2
Total	21.0	44.2	26.7	29.3	34.6	48.3

[1] Total slaughter minus frozen equals fresh. Includes ice-packed, chill-pack, CO^2, etc. [2] Total slaughter minus cut-up and further-processed equals whole RTC. [3] Percentage of total slaughtering plant output only. [4] Percentage of all output, slaughtering plants and non-slaughtering plants. [5] Regional data not shown since interregional movements obscure comparisons.

More than 1,250 federally inspected plants were engaged in some type of processing of young chicken in 1973-75.

Mature Chickens

Over four-fifths of the U.S. output of federally-inspected plants was fresh packs. Nationally, slaughtering plants produced less than three-fourths of their volume as whole RTC birds, over one-fourth as further-processed, and under 1 percent as cut-up. But, for all plants, further-processed accounted for over four-fifths of output, compared with less than one-fifth as whole RTC and over 1 percent as cut-up (table 1).

As with young chickens there were many more non-slaughtering plants cutting-up or further processing mature chickens. However, slaughtering plants (152) still accounted for over 40 percent of the cut-up output and over 30 percent of the further-processed output. Volume of such items produced per slaughtering plant was much greater than average output per non-slaughtering plant (tables 2 and 4).

Almost 450 federally inspected plants were engaged in some type of processing of mature chickens in 1973-75.

Turkeys

Unlike young and mature chickens, over four-fifths of the U.S. output of federally inspected plants was frozen. Nationally, slaughtering plants produced about half of their volume as whole RTC birds, almost 15 percent as cut-up, and nearly 35 percent as further-processed. Whole bird processed (primarily self basting and stuffed birds) accounted for over 55 percent of total further-processed. For all plants, further-processed accounted for almost half, cut-up for over 15 percent, with about 35 percent as whole RTC birds. Further-processed (other than whole bird processed) accounted for over 58 percent of total further-processed (table 1).

Like young and mature chickens, slaughtering plants (139) accounted for most of the volume cut-up or further-processed. There were about the same number of non-slaughtering plants cutting-up tur-

Table 2—Regional percentages of total chicken and turkey meat output produced in slaughtering plants, by pack and product form, 1973-75

Pack and product form	Regions				
	Northeast	Midwest	South	West	U.S.
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
			Young Chickens		
Pack:					
Fresh	100	100	100	100	100
Frozen	100	100	100	100	100
Product form:					
Whole RTC	100	100	100	100	100
Cut-up	48	33	91	70	78
Further-processed[1]	43	13	42	2	38
			Mature Chickens		
Pack:					
Fresh	100	100	100	100	100
Frozen	100	100	100	100	100
Product form:					
Whole RTC	100	100	100	100	100
Cut-up	0	20	50	76	43
Further-processed[1]	28	38	24	24	32
			Turkeys		
Pack:					
Fresh	100	100	100	100	100
Frozen	100	99	99	98	99
Product form:					
Whole RTC	100	100	100	100	100
Cut-up	15	91	85	98	87
Further-processed					
Whole bird	97	98	99	99	98
Other	20	55	55	65	52
Total	22	74	74	81	72

[1] Includes minor amounts of whole bird processed.

Table 3—Young chickens: Number of processing plants performing various functions, 1973-75

Plant group and function	Regions				
	Northeast	Midwest	South	West	U.S.
	Number	*Number*	*Number*	*Number*	*Number*
Slaughtering plants:[1] [2]					
Freeze	9	18	75	4	106
Cut-up	23	22	152	18	215
Further-process[3]	14	6	27	3	50
Non-slaughtering plants:[2]					
Cut-up	252	232	144	122	750
Further-process[3]	128	101	85	57	371
Total all plants:[2]					
Slaughter	29	36	177	21	263
Freeze	9	18	75	4	106
Cut-up	275	254	296	140	965
Further-process[3]	142	107	112	60	421

[1] Slaughtering plants that perform additional functions. [2] Numbers not additive since some plants perform more than one of these functions. [3] Includes small number of whole-bird processed but mainly other further-processed.

keys or producing whole-bird further processed as slaughtering plants performing these functions, but other further-processing was carried out by over 4½ times as many non-slaughtering as slaughtering plants. Volume of such items per slaughtering plant was much greater than average output per non-slaughtering plant (tables 2 and 5).

Over 500 federally inspected plants were engaged in some type of processing of turkeys in 1973-75.

Table 4—Mature chickens: Number of processing plants performing various functions, 1973-75

Plant group and function	Regions				
	Northeast	Midwest	South	West	U.S.
	Number	*Number*	*Number*	*Number*	*Number*
Slaughtering plants: [1,2]					
Freeze	6	15	28	9	58
Cut-up	---	3	7	10	20
Further-process[3]	3	6	5	3	17
Non-slaughtering plants: [2]					
Cut-up	26	30	11	14	81
Further-process[3]	45	80	62	38	225
Total all plants:[2]					
Slaughter	20	35	74	23	152
Freeze	6	15	28	9	58
Cut-up	26	33	18	24	101
Further-process[3]	48	86	67	41	242

[1] Slaughtering plants that perform additional functions. [2] Numbers not additive since some perform more than one of these functions. [3] Include small number of whole-bird processed but mainly other further-processed.

Table 5—Turkeys: Number of processing plants performing various functions, 1973-75

Plant group and function	Regions				
	Northeast	Midwest	South	West	U.S.
	Number	*Number*	*Number*	*Number*	*Number*
Slaughtering plants: [1,2]					
Freeze	17	42	23	21	103
Cut-up	13	28	15	17	73
Further-processed					
Whole bird	3	18	10	7	38
Other	7	30	16	16	69
Non-slaughtering plants:[2]					
Cut-up	30	31	10	13	84
Further-processed					
Whole bird	8	7	8	9	32
Other	79	105	71	67	322
Total all plants:[2]					
Slaughter	29	54	27	29	139
Freeze	17	42	24	22	105
Cut-up	43	59	25	30	157
Further-processed					
Whole bird	11	25	18	16	70
Other	86	135	87	83	391

[1] Slaughtering plants that perform additional functions. [2] Numbers not additive since some plants perform more than one of these functions.

MARKETING AND INTEGRATION IN THE POULTRY AND EGG INDUSTRIES

by George B. Rogers,[1] Leonard A. Voss,[2]
William L. Henson,[1] and Harold B. Jones[1]

ABSTRACT: Plants which pack and break eggs or process poultry are a major link in marketing channels. They are the major receivers of farm production, and major suppliers of retail outlets and further-processing firms. Thus, processing plants perform many assembly, storage, and distribution functions. Many of them are part of vertically-integrated firms which also engage in contract or direct production and input-supplying. Ninety-nine percent of the Nation's broilers and 80 percent each of the market eggs and turkeys are produced by integrated firms. Two-thirds of broiler and market egg output reaches consumers in near-original form through retail outlets, compared with only 40 percent of the turkeys and only 12 percent of the fowl. Egg breaking plant output is virtually all manufactured into products, and half the turkeys and four-fifths of the fowl are further-processed.

KEYWORDS: Eggs, broilers, turkeys, fowl, marketing, integration, channels, plants, firm.

Previous articles have summarized assembly, processing, and distribution costs of packing plants. This article summarizes the marketing practices of and the functions performed by such plants and the other functions of firms of which they are a part. Data from sample processing plants were collected under cooperative agreements between the Missouri, Pennsylvania, and Georgia Agricultural Experiment Stations and the Economic Research Service. In subsequent tabulations, this has been supplemented with information from other studies and trade press articles. Sample plant and firm tabulations may vary somewhat from total industry figures.

Processing plants carry out rather diverse marketing programs and they are engaged in many other related functions. Moreover, they are quite typically units in poultry and egg firms that also are involved in contract or direct production and input-supplying. Thus, the poultry and egg industries are already vertically-integrated to a substantial extent. It is likely that vertical integration will expand in future years as more firms take on additional producing, input-supplying and marketing functions.

Egg Marketing Channels

About 67 percent of market egg production reaches consumers through retail outlets, and only 4 percent is sold directly by producers to consumers. Virtually all of these eggs are graded and cartoned. Institutions, such as restaurants and other public eating places, military establishments, schools, and hospitals, use about 17 percent of output. These are mainly received as graded eggs in cases. Less than 1 percent of egg output is destined for net exports and shipments. The remaining 12 percent of egg volume goes to egg breaking plants. This output goes mainly into egg-containing products, although there are a few regular egg or dietary products sold at retail. Eggs received by breaking plants include both graded eggs and Nest Run eggs in cases.

Shell egg packing plants include various types of operations. Some are producer-packers, such as large integrated operations with producing and packing units at one location. Other plants are either independent or units of integrated firms dependent on contract production. Others are plants owned by distributors or retailers. Data in table 1 represent a mixture of packing plant types. Over 70 percent of the output of shell egg packing plants is cartoned. Direct to retailer movement is close to 60 percent.

Distributors of shell eggs receive some eggs in cartoned form and the balance as graded or Nest Run in cases. Some of these may be run through distributor-owned grading and cartoning plants. Retailers and institutions are the major outlets for distributors, with minor quantities going to breaking plants. Retailer-owned plants are primarily to serve company needs.

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Table 1—Shell eggs: Marketing practices of sample packing plants, by regions, 1973-76

Item	South 1975	Northeast 1974	Midwest 1973-74[1]	West Coast 1973-76	Total or average[2]
Number of plants	17	41	32	19	109
Volume (mil. cs.) per yr.	4.7	11.1	7.5	11.1	34.4
	(Percents)	*(Percents)*	*(Percents)*	*(Percents)*	*(Percents)*
Type of pack:					
% cartoned	71	72	72	73	72
% loose graded	20	25	20	14	20
% ungraded	9	3	8	13	8
Outlets:					
% to distributors	46	29	32	9	29
% to retailers	42	63	57	70	58
% to institutions	8	6	6	7	7
% to export	1	([3])	--	2	1
% to breaking	3	2	5	12	5

[1] Includes small number in Mountain region. [2] Other information included in percents, where available. [3] Less than 0.5 percent.

Table 2—Egg breaking: Marketing practices of sample plants, by regions, 1973-75

Item	Midwest[3] 1973-74	West Coast 1973-75	Total or average[4]
Number of plants	14	10	24
Volume (mil. cs. shell eggs) per year	3.2	1.2	4.4
	(Percents)	*(Percents)*	*(Percents)*
End product type:			
% liquid	27	61	36
% frozen	21	39	26
% dried	52	--	38
Outlets:			
% distributors	11	15	14
% bakeries, institutions	28	33	31
% food manufacturers	58	48	52
% export	3	3	3
% other[1]	([2])	1	([2])

[1] Other breaking plants and pet food. [2] Less than 0.5 percent. [3] Includes Mountain region. [4] Other information included in percents, where available.

Egg breaking plants may engage in a substantial amount of direct distribution to bakeries and institutional users. Most of what they sell to distributors, as well as some of what they sell to food manufacturers (including dryers), eventually goes to bakeries and institutions.

Data in table 2 include plants which produce a larger percentage of liquid and dried eggs than is true nationally. Nationally, liquid egg output accounts for about one-fourth of egg product production, frozen eggs for over two fifths, and dried eggs for the balance. In total, bakeries use almost half of egg product output, over two-fifths go to food manufacturers, and most of the balance to institutions.

Broiler Marketing Channels

About 66 percent of broiler output reaches consumers through retail outlets. Another 25 percent moves to the insitutional trade, with fast food outlets alone accounting for around three-fourths (about 19 percent of the total). Further-processing uses 6 percent, and the balance of 3 percent is exported, mainly as frozen whole birds and parts.

Data in table 3 approximate current broiler processing plant practices. But in recent years ice-packed has probably declined slightly, and the proportions produced in the cut-up and further-processed forms have increased slightly.

Distributors play an important role in broiler marketing. These include not only independent firms but also units affiliated with retail chains and a growing number owned or franchised by processors. The volume of broilers moving to all types of distributors slightly exceeds that moving directly to retailers from processing plants. Distributors supply about 64 percent of the needs of the institutional trade and about 41 percent of the needs of retail outlets. Direct shipments from processing plants supply the balance.

Turkey Marketing Channels

Over half of the national output of turkey meat is now used in producing further-processed items. Whole-bird processed turkeys (includes self-basting) account for over 40 percent of this output and other more extensively further-processed products for the balance. Production of further-processed products by slaughtering firms account for almost 73 percent of total further-processed output and includes about 97 percent of the whole-bird processed turkeys.

Table 3—Broilers: Marketing practices of sample processing plants, by regions, 1973-75

Item	South 1974	North-east 1974	West Coast 1973-75	Total or average[3]
Number of plants	16	13	8	37
Volume (mil. lbs. RTC) per yr.	855	411	279	1,545
	(Percents)	*(Percents)*	*(Percents)*	*(Percents)*
Type of pack:				
% ice-packed[1]	57	75	44	59
% deep chill	22	15	43	24
% CO_2[1]	13	5	12	11
% frozen	8	5	1	6
Product form:				
% whole	70	60	55	64
% cut-up	26	34	41	31
% further-processed	4	6	4	5
Outlets:				
% to distributors[2]	53	55	19	47
% to retailers[2]	31	30	65	37
% to institutions	9	6	11	9
% to export	3	3	1	2
%to processing	4	6	4	5

[1] May include small amounts of combination packs. [2] May include company-owned distributors of processors and other firms. [3] Other information included in percents where available.

Data in table 4 appear to include a substantial share of plants which market more turkeys in fresh form, as whole birds, and direct to retailers than many other plants. Nationwide, frozen turkeys account for close to 85 percent of output, and about 17 percent are cut-up.

Table 4—Turkeys: Marketing practices of sample processing plants, by regions, 1973-74

Item	Midwest South 1973-74	West 1973-74	Total or average[2]
Number of plants	9	10	19
Volume (mil. lbs. RTC) per year	239	194	433
	(Percents)	*(Percents)*	*(Percents)*
Type of pack:			
% ice-packed[1]	12	4	9
% deep-chill[1]	10	14	11
% frozen	78	82	80
Product form:			
% whole	65	57	62
% cut-up	12	14	13
% further-processed	23	29	25
Outlets:			
% to distributors	14	14	14
% to retailers	55	46	51
% to institutions	6	7	6
% to export	2	3	2
% to processing	23	30	27

[1] May include small amounts of other packs. [2] Other information included in percents where available.

About 84 percent of whole, cut-up and further-processed turkey products reach consumers through retail outlets, 14 percent are used by institutions, and 2 percent are exported. Over four-fifths of retail supplies are obtained directly from processing plants and the balance from distributors. Processing plants probably supply over half the needs of the institutional trade.

Fowl Marketing Channels

Spent fowl from egg producing flocks are the predominant item included in mature chicken slaughter. Over four-fifths of mature chicken slaughter is further-processed and about 30 percent of this is done by slaughtering plants.

Over 12 percent of mature chicken slaughter reaches consumers through retail outlets and under 7 percent goes to the institutional trade. Plants supply almost 60 percent of retail needs and over 40 percent of institutional needs, and distributors the balance.

Data in table 5 include a substantial share of plants which did less further-processing and more selling to distributors and retailers than many other plants.

Table 5—Fowl: Marketing practices of sample processing plants, by regions, 1973-74

Item	Midwest South 1973-74	West Coast 1973-74	Total or average[2]
Number of plants	9	6	15
Volume (mil. lbs. RTC) per year	164	25	189
	(Percents)	*Percents)*	*(Percents)*
Type of pack:			
% ice-packed[1]	79	28	70
% deep-chill[1]	8	5	8
% frozen	13	67	22
Product form:			
% whole	75	90	77
% cut-up	1	10	2
% further-processed	25	--	21
Outlets:			
% to distributors	9	59	18
% to retailers	14	19	15
% to institutions	5	13	6
% to export	--	3	1
% to processing	72	6	60

[1] May include small amounts of other packs. [2] Other information included in percents, where available.

Processing Plant Functions (Tables 6, 7, 8, 9, 10)

Many plants surveyed bought some poultry or shell eggs on the open market. This included all of the fowl processing plants but less than one-fourth

Table 6—Functions performed by firms with shell egg plants, by regions, 1973-76

Item	Regions				
	South 1975	Northeast 1974	Midwest 1973-74[1]	West Coast 1973-76	Total[2]
Number of plants	17	41	32	19	109
Plants which:					
Buy eggs	8	28	15	6	57
Assemble eggs	14	27	27	13	81
Grade, pack	17	41	32	19	109
Carton	17	41	32	19	109
Break	1	3	7	8	19
Freeze	1	3	4	6	14
Dry	0	0	1	1	2
Receive, warehouse, store	5	4	13	16	38
Long-distance haul	10	14	16	7	47
Deliver to retailers, institutions	14	33	27	17	91
Plants which are part of firms having:					
Hatcheries	2	7	5	0	14
Feed mills	7	12	10	5	34
Own production	7	27	18	15	67
Contract production	8	10	7	2	27
Pullet rearing	5	1	8	7	21
Grain production	1	1	2	2	6

[1] Includes small number in Mountain region. [2] Some may be associated with poultry processing and breeding flocks.

of the broiler processing plants. Most of the broilers and major shares of the shell eggs and turkeys are produced by integrated firms. Most plants also conducted their own assembly operations, although some used contract haulers. With some egg breaking and shell egg plants, delivery to the plant was sometimes made by the seller.

A substantial majority of the egg breaking, turkey, and fowl plants carried out substantial receiving, warehousing, and storage operations, since much of the output was frozen. With shell eggs and broilers moving in and out of plants more rapidly, receiving, warehousing, and storage was less significant. From less than half of the shell egg plants to almost three-fourths of the fowl plants did long-distance hauling in their own vehicles. Contract haulers carried the balance. Direct deliveries to retailers and institutions were made by a majority of plants, ranging from over three-fifths of the shell egg plants to 100 percent of the turkey plants. Some retailers or institutions also picked up supplies at processing plants.

Many egg processing plants carried out both shell egg packing and egg breaking operations. Many plants which break eggs produced both liquid and frozen eggs, and a few produced dried egg. Most broiler processing plants also had cut-up lines, as did almost three-fifths of the turkey plants, and a third of the fowl plants. Less than a third of the broiler plants engaged in further processing.

It is likely that more shell egg plants will engage in egg breaking in the future. A modest expansion into cutting-up and further-processing may also occur in slaughtering plants.

Table 7—Functions performed by firms with egg breaking plants, by regions, 1973-75

Item	Regions		
	Midwest[1] 1973-74	West Coast 1973-75	Total[2]
Number of plants	15	10	25
Plants which:			
Buy eggs	13	5	18
Assemble eggs	9	7	16
Grade, pack	8	7	15
Carton	7	7	14
Break	15	10	25
Freeze	11	9	20
Dry	5	–	5
Receive, warehouse, store	13	9	22
Long-distance haul	9	5	14
Deliver to retailers, institutions	12	10	22
Plants which are part of firms having:			
Hatcheries	1	–	1
Feed mills	1	1	2
Own production	6	5	11
Contract production	2	1	3
Replacement rearing	2	1	3

[1] Includes Mountain region. [2] Some may have breeding flocks.

Table 8—Functions performed by firms with broiler packing plants, by regions, 1973-75

Item	Regions			
	South 1974	North-east 1974	West Coast 1973-75	Total[1]
Number of plants	17	13	8	38
Plants which:				
Buy live or RTC	2	4	3	9
Assemble live	10	9	6	25
Slaughter, eviscerate	17	13	6	36
Cut-up	15	10	8	33
Further-process	2	6	4	12
Receive, warehouse, store	8	5	6	19
Long-distance haul	5	6	5	16
Deliver to retailers, institutions	10	11	8	29
Plants which are part of firms having:				
Hatcheries	17	8	3	28
Feed mills	17	9	3	29
Own production	3	10	6	19
Contract production	17	12	5	34

[1] Some may have breeder flocks and be associated with rendering plants.

Table 9—Functions performed by firms with turkey packing plant by regions, 1973-74

Item	Regions		
	Midwest, So. Northeast 1973-74	West 1973-74	Total[1]
Number of plants	13	10	23
Plants which:			
Buy live or RTC	8	7	15
Assemble live	12	8	20
Slaughter, eviscerate	13	8	21
Cut-up	9	6	15
Further-process	10	5	15
Receive, warehouse, store	11	10	21
Long-distance haul	7	6	13
Deliver to retailers, institutions	12	10	23
Plants which are part of firms having:			
Hatcheries	4	4	8
Feed mills	6	4	10
Own production	5	5	10
Contract production	7	6	13
Breeder flocks	2	4	6

[1] Some may also be associated with rendering plants.

Table 10—Functions performed by firms with fowl packing plants, by regions, 1973-74

Item	Regions		
	Midwest, South 1973-74	West Coast 1973-74	Total[1]
Number of plants	9	6	15
Plants which:			
Buy live or RTC	9	6	15
Assemble live	9	4	13
Slaughter, eviscerate	9	4	13
Cut-up	1	3	4
Further-process	4	1	5
Receive, warehouse, store	6	6	12
Long-distance haul	8	3	11
Deliver to retailers, institutions	8	6	14
Plants which are part of firms having:			
Hatcheries	---	2	2
Feed mills	1	1	2

[1] Some may also be associated with rendering plants.

Firm Functions (Tables 6, 7, 8, 9, 10)

Almost all broiler processing plants belonged to firms which were engaged in contract production and/or produced broilers on their own farms. A majority of the turkey processing and shell egg processing plants also were associated with firms having contract or owned-farm production, as were a sizable (and growing) number of egg breaking plants. Nationally, it is estimated that 90 percent of the broilers are produced under contract and 9 percent are produced on company-owned farms. For turkeys, 52 percent are produced under contract and 28 percent are produced by large integrated firms. For eggs, about 43 percent are contract production and 37 percent are produced by owner-integrated operations.

About three-fourths of the firms with broiler processing plants had hatcheries and feed mills. Substantial numbers of firms with shell egg processing and turkey processing plants also had feed mills and hatcheries. Some firms maintained breeder flocks and raised replacements.

A few firms were engaged in grain production. This may expand in future years and feed ingredient storage capacities at feed mill sites may increase. Some poultry firms owned rendering plants for directly recycling poultry byproduct meal into feed milling operations. Many firms with production operations were selling manure and litter to crop farmers. A few were producing dried fertilizer, and, in some instances, manure and litter were going to cattle feeding operations.

Highlights of Egg Marketing Team Report

George B. Rogers and William E. Cathcart [1]

ABSTRACT: The Secretary of Agriculture appointed a team in March 1972 to study the egg industry and to make recommendations on how the egg industry could better perform and improve producers' net incomes. This is a summary of the team's report to the Secretary in August 1972.

KEY WORDS: Egg production, egg marketing, egg industry.

In March 1972, the Secretary of Agriculture established a study team to examine ways the egg industry could better perform its production and marketing functions, enhance producer net incomes, and improve the use of and satisfaction from using egg products.

The team's report, completed in August, identified a wide range of problems and their causes, and made a substantial number of recommendations for industry and government actions. The full report is available on request.

The team made several hundred contacts with industry members, trade associations, State department of agriculture, college and university extension and research workers, and individuals in Federal agencies in order to identify egg industry problems and discuss solutions. This summary of the team's report reflects views of the various industry segments. As such, it is strictly advisory and is not an official position of USDA.

The egg industry has a commendable record in improving efficiency and product quality but significant problems still persist. Identification and discussion of these problems and possible solutions can help make transitions more orderly. Bringing about desirable changes will necessitate even closer cooperation between the industry and government. The importance of accurate information for decision-making and the role of public agencies need to be spelled out more clearly.

A declining demand for eggs has been due to changes in eating habits, lack of knowledge about the nutritional values of eggs, and adverse publicity. The industry has suffered from periodic and prolonged price depressions because of its inability to keep supply in line with demand at reasonable prices. And the egg industry faces the growing impacts of consumerism, changes in transportation systems, and efforts to protect consumer health and achieve a cleaner environment. These problems need to be met without placing unreasonable burdens on the industry.

Industry-Government Cooperation

Government programs are of vital concern to the egg industry. USDA can do a better job of informing the public on the industry's accomplishments and problems and in keeping channels open for consultation and planning. Similarly, the egg industry can do a better job of working with government agencies. The industry needs better organization to more effectively communicate with government agencies, the Congress, and the public. USDA can help by:

—Making positive and timely statements of industry accomplishments and progress under USDA research, extension, and regulatory programs.

—Avoiding statements which could unnecessarily damage egg use.

—Becoming more involved in nutrition-related matters and putting out facts on such matters.

—Developing better working relationships with other Federal agencies to more adequately represent the industry at the decision-making stage.

—Maintaining communication with the industry on regulatory and other matters.

—Establishing early warning systems and planning more with the industry on potential problems.

Instability and Supply Response

Most egg-producing firms use the cash method of accounting for reporting Federal income taxes. Many industry people believe that cash accounting causes producers to expand. Producers should be required to classify chickens used for producing eggs as a capital asset under the cash method of accounting and as soon as possible the industry should be converted to the accrual method.

The egg industry is plagued by cyclical and seasonal instability in output and prices. USDA and the industry may need to seek stanby enabling legislation to use Federal powers to stabilize prices and output. A study should be made of such alternatives as volume regulation, pricing programs without volume restraints, or price-support programs with voluntary compliance.

Demand

Demand for eggs has declined since World War II because of changing consumer eating habits. Adverse publicity about cholesterol, contaminants, additives, and other items also have contributed. Only minimal industry resources have been devoted to advertising, promotion, and product development to increase egg use. The egg industry has not had the cushion of increased demand withing which to seek solutions to structural and supply problems.

[1] Leader, Poultry Groups, Marketing Economics Division and Heads, Poultry Section, Economic Statistical Analysis Division, Economic Research Service, USDA.

Government programs have a significant impact on egg use. Government agencies should place more emphasis on: (1) purchase programs to maximize their effectiveness in stabilizing price movements, (2) research funding to develop new egg products acceptable to consumers, (3) making maximum use of USDA's Plentiful Foods Program to inform consumers when eggs are favorably priced, (4) providing educational programs to consumers on how to use eggs and egg products, and (5) encouraging additional egg use in government sponsored feeding programs, and including eggs under the P.L. 480 program to fortify inadequate protein diets in foreign countries.

The Commodity Surplus Disposal Program should be reoriented to provide nutritionally balanced diets to participants, with special emphasis on protein foods such as eggs. The proposed shift in welfare payments from a commodity to a cash basis should be studied for possible adverse impacts on egg consumption.

USDA and the industry should support recently proposed national checkoff legislation for egg promotion, advertising, and product development.

Information and Data series

USDA reports are widely used by the egg industry. USDA should revise data series to reflect industry characteristics and needs. The industry shares responsibility for assuring the adequacy of government data.

Better coordination of data collection and publication efforts by USDA's Market News Service is needed to curtail mounting costs. Industry support is necessary to provide accurate input data. Two new data series needed are a weekly inventory of holding of egg solids in the industry, and weekly retail selling prices for cartoned eggs.

The Statistical Reporting Service (SRS) issues most of USDA's monthly and annual data series. SRS series on hen numbers, production, and farm prices need to be changed to separate the market and hatching egg components. They also need to expand the use of multiple frame sampling. Improved data series on forced molting, growing and laying house mortality, and prices farmers pay for feed are needed. SRS should report all statistics on a calendar month and annual basis to make it easier for industry and government analysts to use the various series.

Census data formely provided periodic benchmarkes for evaluation of SRS and other data series. The recent Census omitted data on egg output. The Special Census, on the other hand, contains some new series on the indusrry. USDA and the industry should work to restore and preserve information on eggs in future Census enumerations.

Many difficulties experienced in long-range statistical programs and action programs result from the lack of adequate accounting of egg-producing flocks. Thus, USDA and the industry should sponsor an inventory (with periodic updating) of egg producing flocks and their characteristics.

The possibility of consolidating and reorienting the Poultry and Egg Situation issued by the Economic Research Service and the Egg Marketing Guides issued by the Agricultural Marketing Service should be studied.

Egg Pricing

Congress funded an extensive program of research on egg pricing during 1966-70. The National Egg Pricing System Study Committee has been working on a program of improvements and means of implementation. Egg pricing improvement must be accomplished through clearly legal mechanisms, have adequate soruces of funding, and command widespread acceptance.

Industry and USDA support of legislation to authorize the collection and expenditure of checkoff funds would help. The funds could be used for such purposes as determining and publishing base price quotations, supporting cash trading mechanisms, establishing committees to aid in price determination, developing new and improved data series, and carrying out related research.

Trading in futures is done under the Chicago Mercantile Exchange's fresh egg contract. USDA's Commodity Exchange Authority has funded research on futures trading. It would be helpful for CEA to schedule hearings to discuss the findings and proposals before deciding whether to recommend amending or terminating the contract.

Competitive Practices

A mechanism should be set up in USDA to provide advice, guidance, and help to family-sized units engaged in egg production. Through a single initial contact, producers could be directed to appropriate aid and given ombudsman-type assistance in dealing with industry firms and government agencies. USDA lending agencies should discourage expansion in low-priced periods. Lending guidelines for government agencies should stress the development of efficient units through expansion of existing units rather than creating new units.

Egg trading practices are under Federal Trade Commission jurisdiction. This authority should be transferred to the Packers and Stockyards Administration in USDA to assure prompt payments for eggs and fowl and to undertake licensing and bonding of handlers.

Despite numerous comments about the effects of the entry of input-supplying, marketing, and retailing firms into egg production, no barriers to entry should be erected. Any adverse effects from integration can best be resolved throught the use of present regulatory powers (including antitrust), elimination of tax shelter loopholes, and an expansion of legitimate producer bargaining opportunities. Retail margins and practices also have been widely discussed. USDA's Economic Research Service should study the effects of "loss

leaders" on the level and movement of egg prices and on retailer margins, costs, and practices.

The large number of egg producers relative to buyers suggests a need for enhanced producer bargaining. When the necessary authroity is provided under the Packers and Stockyards Act, USDA should carry out surveillance of the conditions and terms of price transactions and the terms and practices involved in contract production. The industry and USDA should support legal mechanisms to permit producer-handler negotiations and bargaining standards and responsibilities.

Production and Marketing Issues

Research has provided useful information to industry, and it should be continued, but changes in the egg industry pose new problems which need attention. USDA should take a leadership role in working with other Federal and State agencies.

The Economic Research Service should make annual surveys of egg producers' costs and returns, by size and type of unit. Studies are also need on aggregate impacts of State and local taxes on egg producers and means of reducing tax burdens, and on the impact of labor safety standards on producers and marketing firms.

ERS and the Agricultural Research Service should work with the Food and Drug Administration in evaluating feed additives. ARS production-oriented research should stress factors involved in reducing costs and minimizing egg breakage on the farm and in marketing channels.

ARS market-oriented research should focus on food distribution center location and delivery systems, facilities and equipment in grading and packing container design and handling systems to minimize breakage, and redesign of retail containers to permit addition of brand identification.

ERS needs to make studies and carry out surveillance of assembly, packing, distributing, and retailing costs and returns. Effects of reduced rail service to producers, marketing firms, and rural economies should be studied.

USDA and the industry should oppose the removal of eggs from the list of commodities which may be hauled by truckers exempted from ICC rate regulation. USDA and the industry should work with ICC to reduce inequities in rates on inbound feed ingredients.

AMS needs to evaluate effects of a possible reduction in the number of grades and weight classes for eggs.

Environmental protection and land use regulations will require egg producers and packing plants to make numerous adjustments. USDA should lead in working with the Environmental Protection Agency to develop inepensive waste treatment methods and do research on the methods, costs, potentials, and safety of recycling wastes as feed or marketing them in fertilizer or industrial products. Land use and zoning guidelines should be developed to assist planning agencies in determining locations and land requirements for egg operations to minimize environmental damage and public and industry costs.

SOLVING EGG INDUSTRY PROBLEMS

by

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ABSTRACT: Unlike eggs themselves, which are relatively uniform in shape and quality, industry problems come in a wide variety of sizes, shapes, and ages. The Egg Marketing Team report, reviewed in the September 1972 Poultry and Egg Situation, idenified many problems and possiable solutions. A year later real progress is evident. But among the major unresolved issues are: further improving the egg pricing system, a need to increase demand, and finding a way to better stabilize output and prices.

KEYWORDS: Eggs, Problems, Solutions

Problem Identification and Solution

In early 1972, Secretary Butz appointed 5 study teams, including one for eggs. These teams were directed to identify industry problems and suggest solutions. The egg report discussed a large number of issues, broadly grouped under industry-government cooperation, instability and supply response, demand, information and data series, egg pricing, competitive practices, and production and marketing issues. Many problems were of long standing or related to other sectors of the agricultural and non-agricultural economics.

Much tangible progress has been made in the past year toward solving egg industry problems and future years should see additional accomplishments. But, where legislative remedies, Government policy changes, and full inter-industry cooperation are necessary, progress may come slowly.

The Department of Agriculture issued a press release and detailed statement on July 13, 1973, on the changes effected on issues raised in study team reports. For eggs, accelerated research on costs, returns, margins, "loss-leaders," and tax accounting; stepped-up outlook work; improved price, production, and inventory statistics; a prompt payment regulation on fowl; studies of waste disposal methods and environmental problems; and expanded Extension efforts were noted. Trade sources also noted the more visible and persistent role of USDA officials in telling agriculture's story to the public and in representing agriculture in the highest councils of Government.

The industry has taken significant steps in the past year. Trade organization representatives have been working more closely on current problems and speaking with a more unified voice. On some issues, one organization with the greatest expertise may take a leading role. Greatly expanded promotion funds have been raised and new State acts passed. The proposed national checkoff bill has widespread support and legislation could be introduced. A draft of a proposed egg industry stabilization act has been prepared and distributed for discussion. Legislation to transfer authority over regulatory practices on eggs from the Federal Trade Commission to USDA is under consideration. Cash trading on eggs has been expanded by grades and geographically. Some new price quotations have been developed. Industry groups have been active on the Northeastern railroad problem, broader commodity exchange supervision, price control removals, and fuel and environmental problems.

Forces in the Industry's Future

The future economic environment of the egg industry will bear upon the problems to be solved and the methods used. Several forces are likely to result in higher production and marketing costs and may require higher price levels than those from late 1970 to late 1972 to preserve reasonable rates of return.

1. The fuel crisis commands much current attention. Technological problems and the lead time to build new facilities may mean a 3-5 year period to increase domestic output and offset probable reductions from foreign sources. Fuel has in the past been a small and often-ignored item of cost to the egg industry. Future costs will be higher, and management will be increasingly concerned with supply problems and fuel-conserving measures.
2. Higher fuel and wage costs, the precarious financial position of many railroads, and a lack of lower-cost alternatives may mean higher long-distance transportation costs for feed ingredients. Despite larger domestic production there is continued strong foreign demand and a world-wide tight protein feed situation suggesting higher feed prices than prior to 1973.
3. Environmental improvement through abatement of water, air, noise, and odor pollution, plus zoning actions, is likely to boost investment and operating costs. Net additions to costs are likely even with better markets for poultry wastes and recycling as feedstuffs. Impacts on individual firms and areas may be diverse.
4. Rising wage rates, due to negotiated contracts, minimum wage legislation, and cost-of-living adjustments will affect producers and marketing firms. In some areas, the surplus labor pool is disappearing, and difficulties are being encountered in maintaining a full work force. An incentive exists for more mechanization.
5. The activities of Occupational Saftey and Health Administration could have mixed results and the precise effect on costs is uncertain. Safer working conditions are an unassailable objective, and better attendance and fewer accidents could enhance productivity. But additional investment is likely.

Other forces may result in enhanced efficiency and be a partial offset to higher average input costs.

1. Declining numbers of producing units and larger average unit size can raise industry efficiency. From 1964 to 1969, the number of farms producing eggs declined about 60 percent. Both farm numbers and numbers of birds declined in flocks of less than 10,000 birds, but increased for flocks over 10,000. Numbers of producing units may have declined a third from 1969 to 1973, with units and volume up substantially in flocks of 30,000 or more and down substantially in flocks under 4,000.
2. A recent trade estimate stated that a one-man operation, with family labor and producing loose-packed eggs in cases, could care for 25,000 layers. Most farms have not reached this level of labor efficiency, but may approach it in the years ahead.
3. Other economics of scale exist well beyond the 25,000 size. Housing, equipment, management, and feed and supply prices probably fall in this category.
4. Remaining small producing units (hobbies, part-timers, and local-market servers) are being increasingly excluded from commercial marketing channels. Economics of scale in packing and marketing activities, larger supplying farms, and more direct marketing channels promise further efficiency.
5. Various forms of integration are still growing. By 1971-72, 55 percent of volume was covered by owner-integrated operations, contract production, or contract marketing. Horizontal integration may offer additional economies in marketing and capital access.
6. The National Commission on Productivity has convened panels of industry and Government representatives on many commodities. Use of a similar approach on eggs could produce a whole spectrum of ideas, ranging from research needs to public program changes.

Some Major Industry Problems

From the substantial array of egg industry problems in various stages of solution or development, three have been selected for elaboration: pricing system, demand, and price and volume fluctuations. All three are problems of long-standing and cannot be solved without concerted industry action.

The egg pricing system rests on several base price quotations determined by a few organizations. Around base price quotations are many premium and discount arrangements.

When the egg industry underwent rapid changes in the 1950's and 1960's, the established pricing system did not keep pace. Mounting industry concerns over the kind of signals generated and over the system's credibility led to calls for changes or for development of a moderized system.

Discussions between industry, State, and Federal agencies led to the planning of a comprehensive research program by 1965. Congress provided special funds for such a study, which was carried out by USDA agencies and 13 State agricultural experiment stations from 1966 to 1969. A special task force composed of representatives of industry groups, National Association State Departments of Agriculture, and USDA was formed in mid-1969 to study the research findings and make recommendations for needed changes. The task force, the National Egg Pricing System Study Committee,

was particularly active for the next 2 years, reporting its recommendations and initiating actions to bring about improvements. Many changes have been made by industry and public agencies.

Until the discontinuance of cash egg trading on the New York and Chicago Merchantile Exchanges in March 1970, these mechanisms furnished important inputs to the process of determining base price quotations. But such trading had become thin and unrepresentative, and was oriented to wholesale markets. Reporters had to broaden their outside contacts to get information. In 1971, a new trading exchange began operation. It did not require buyers and sellers to be physically present or to trade through licensed broker-members. It stressed trading in lots of commercial size and nest-run grades, and drew from a larger volume base. Some new quotations have become available over the last few years.

Some unresolved problems related to the pricing system are: relative bargaining power of the industry and its customers, improvement and cooridination of the short-run information—gathering and dissemination activities of public and private agencies; financing of new methods of price determination; and recognition of area differences and different segments of the total market in quotations.

Demand for eggs has declined rather persistently since the end of World War II. The problem focuses in the shell egg market, since per capita usage of eggs in processed form has trended slowly upward to the present 12 percent of total usage. Change in eating habits have been important. But the industry has not promoted its products to the same extent as many other industries. Domestic egg demand has also been hurt by the "cholesterol scare."

The industry by itself and through various programs has begun to spend more on advertising, promotion, consumer education, and research. But basic shifts in eating habits may be only partly reversible. Examination of the various components of total demand for eggs is also underway. These include the growing institutional market (16 percent of total usage), use of eggs in public feeding programs, the Food Stamp program, commercial export markets, and international programs.

Instability of prices and volume is a long-time industry characteristic. The egg price cycle was an accepted feature of the industry until the 1960's. For a few years in the early to mid-1960's, coincident with a rapid spread of vertical integration, the cyclical pattern seemed to disappear. Costs and prices were quite well in balance. This gave rise to hopes that integration had brought stability. But by 1965-66 the egg price cycle re-emerged. The industry experienced a severe price and returns depression in 1967, followed by sharply higher prices and returns in late 1969 and early 1970. Rapid production response led to a severe and prolonged price and returns depression which persisted for much of 1971 and 1972. Prices rose in late 1972 and continued sharply upward in 1973. A buildup in production is now underway.

If the industry would not over-react to peak prices and returns, then the troughs would be less severe, too. In an industry which is becoming more capital-intensive and thus has high fixed costs, there is probably less tendency to "under-produce" than to "over-produce". While hope persists after every "boom and bust" cycle that the industry has learned not to over-react to good prices and returns, some new force may be needed to alter behavior. There seem to be two main choices. The industry can press for laws to permit it to curtail over-response to high prices and returns, and it can work for vastly improved information, communication, and understanding.

The legislative path to greater price and volume stability would require widespread agreement and a concerted effort. Some such efforts are underway, but industry opinion is still divided. Also more accurate, timely, and widely-disseminated information could enchance industry confidence and bring forth better planning.

EXOTIC NEWCASTLE DISEASE

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ABSTRACT: The Exotic Newcastle disease outbreak in Southern California has resulted in nearly 11 million layers being destroyed. California's share of the Nation's egg production, layer numbers, and mature hen slaughter dropped in 1972. Exotic Newcastle disease has been eradicated from all areas but Puerto Rico and a small area in Southern California.

KEY WORDS: Exotic Newcastle disease, depopulation, quarantine, task force.

The U.S. egg industry has experienced its first major outbreak of exotic Newcastle disease. Outbreaks first occurred in New Mexico, Texas, Florida, and Northern California in 1971. But the outbreak in southern California late in 1971 was by far the most serious. The outbreaks in New Mexico, Texas, Florida, and Northern California were contained without further spread and were eliminated. Early in 1972 Puerto Rico was placed under quarantine to prevent the disease from spreading from there to the United States.

On March 14, 1972, the Secretary of Agriculture declared a national emergency to combat and eliminate the disease. A task force comprised of State and Federal personnel was established in Southern California soon after the declaration of the emergency to conduct the eradication activities. An eight county area consisting of 45,000 square miles in Southern California was quarantined. In addition to the imposition and enforcement of strict quarantines, the program consisted of destroying all infected and exposed flocks with indemnity payments to owners for the birds destroyed, the cleaning and disinfection of the premises in which the birds were located, and a supervised vaccination program of the poultry within the quarantined area. The vaccination program was designed to reduce the amount of virus produced and to retard the spread of the disease.

As of June 13, 1973, the task force has inspected over 425 million birds, supervised the vaccination (including repeats) of 112 million birds, and disposed of over 11.5 million birds. Most of the birds destroyed have been laying hens but some pullets, chicks, turkeys, and other domestic and wild birds have also been destroyed. Of the total birds destroyed approximately 10.8 million have been laying hens from 159 commercial flocks in Southern California. Most of the layers were destroyed in 1972 at the height of the outbreak.

The task force depopulated around 9 million layers in 1972 in Southern California. To prevent the disease from spreading, the task force tried to locate and destroy as many infected birds as quickly as possible. The task force started depopulating layers in Southern California in December 1971. This was halted in January 1972, when the State of California ran out of funds to pay its share of the indemnities. Depopulation started up again in March following the declaration of a national emergency which permitted the Federal Government to pay all the indemnities. Approximately 2 million layers were destroyed during the first 4 weeks and an additional 1 million in the next 8 weeks. The weekly average then dropped off until early September. At this time, a large operation having approximately 2.8 million layers was found to have the disease and the entire flock were depopulated. Depopulation of this flock was completed the last week in November.

During the first 5 months of 1973 approximately 2 million more layers were destroyed. Over one-half of these were destroyed in the first 2 weeks of the year.

The task force, through depopulation and vaccination, has lifted the quarantine from all areas but Puerto Rico and part of Southern California. The

Table 1.— Layers: Number in U.S. and California and percentage California of U.S. first of month, 1965-1972

Month	Layer Numbers								Percentage[1]			
	1965-69[2]		1970		1971		1972		1965-69	1970	1971	1972
	U.S.	Calif.	U.S.	Calif.	U.S.	Calif	U.S.	Calif.				
	Thousands		*Thousands*		*Thousands*		*Thousands*		*Percent*	*Percent*	*Percent*	*Percent*
January	314,983	35,869	317,517	38,336	326,643	42,000	321,437	42,040	11.39	12.07	12.86	13.08
February	311,830	35,875	315,037	38,336	321,562	41,160	320,146	42,040	11.50	12.17	12.80	13.13
March	309,103	35,390	314,134	39,103	317,722	40,748	315,265	41,620	11.45	12.45	12.84	13.20
April	307,369	35,762	312,294	39,494	315,552	41,562	311,660	40,788	11.63	12.65	13.17	13.09
May	303,528	35,265	310,644	40,679	311,866	41,146	304,032	38,749	11.62	13.10	13.19	12.75
June	300,742	35,532	307,324	39,865	309,487	41,557	300,660	37,974	11.81	12.97	13.43	12.63
July	298,240	35,673	306,939	41,061	306,500	41,557	298,337	37,974	11.96	13.38	13.56	12.73
August	297,401	36,102	306,912	40,650	307,139	41,557	299,806	37,974	12.14	13.24	13.53	12.67
September	302,447	36,232	310,206	40,244	309,114	41,557	299,396	38,354	11.98	12.97	13.44	12.81
October	308,862	36,581	316,762	41,653	311,941	41,557	300,595	37,586	11.84	13.15	13.32	12.50
November	312,564	36,576	320,157	41,236	317,091	41,972	302,061	36,458	11.70	12.88	13.24	12.07
December	315,335	36,830	323,845	42,045	321,053	42,465	302,120	35,246	11.68	12.98	13.23	11.67

[1] California layer numbers expressed as a percent of total U.S. layer numbers. [2] Simple average of 1965-69.

quarantine area in Southern California has been reduced from the original 45,000 square miles to around 200 square miles. On April 16, 1973, the supervised vaccination program was discontinued.

The Exotic Newcastle disease outbreak has had little apparent economic impact on the egg industry nationally. Whatever effect it has had probably has been masked by other powerful economic forces impinging on the supply of eggs in the past year.

The Southern California egg industry and individual producers have suffered serious disruption of business. California, the Nation's largest egg producer, accounted for 12.9 percent of the 70,082 million eggs produced nationally during the 1971 marketing year. California's output in 1972 dropped to 8,652 million eggs or 12.4 percent of total U.S. production. California's output in 1972 fell 4 percent from 1971, while output elsewhere fell less than one-half a percent.

The number of layers in California averaged 41.5 million in 1971. This was 13.2 percent of the national average. In 1972, layer numbers in California dropped to 39.2 million or 12.8 percent of the U.S. total. During 1972 the average size of California's laying flock fell 6 percent, while the flocks elsewhere dropped only 2 percent. Table 1 lists the number of layers on hand the first of the month nationally and in California. This shows that California's share dropped during most of 1972. On May 1, 1972, the percentage dropped below May 1970. The monthly percentage has remained below 1970 levels since May.

The Newcastle disease outbreak was probably the major cause of the sharp decline in the number of chickens (excluding broilers) sold during 1972 in California. The number of chickens sold in California dropped from 10.7 percent of the Nation's total in 1971 to 7.5 percent in 1972. Those sold in California dropped 34 percent from 1971, while those sold elsewhere only dropped around 2 percent. As a result, the number of mature chickens slaughtered under Federal inspection in California dropped from 9.7 percent of the Nation's total in 1971 to 8 percent in 1972.

The main reason for the large drop in the number of chickens sold and mature hens slaughtered under Federal inspection in California in 1972 was the large increase in the number of chickens lost including those lost due to Newcastle disease. The number of chickens lost in California in 1972 was 93 percent greater than 1971. Losses for the rest of the Nation dropped about 15 percent. If the chickens depopulated due to Newcastle disease had been taken out of the number of chickens lost, then the number of chickens lost in California in 1972 would have been 23 percent less than in 1971.

Although the U.S. egg industry has lost several million layers in Southern California since the Newcastle disease outbreak, the economic damage from the disease may have been reduced due to the time it occurred. The disease struck when there was a relatively large flock, an increasing rate of lay due to the use of Marek's vaccine, and depressed egg prices. Egg prices were at very low levels during most of 1970 and 1971, often below the cash cost of production. The egg industry was encouraging producers to reduce their layer numbers to bring production more in line with demand. As a result, hatchery activity was reduced and culling of old flocks stepped up. U.S. layer numbers declined 20.6 million in 1972 to 300.8 million on January 1, 1973.

Southern California's flock reduction was greater than other areas. Replacements for 54 percent of the commercial birds depopulated are back in production now.

THE ENERGY SITUATION AND OUTLOOK FOR THE POULTRY AND EGG INDUSTRIES[1]

by

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ABSTRACT: Recent increases in energy costs and diminishing energy supplies have intensified the need for information concerning energy use in the poultry industry. Energy use estimates were made for poultry production and marketing. Conservation techniques for the present and the future are proposed as partial solutions to increasing energy costs and energy availability problems.

KEYWORDS: Eggs, broilers, turkeys, energy, production, marketing.

Uses of energy

The poultry and egg industries are users of substantial quantities of various types of energy. In 1974, energy expenditures by these industries were close to $550 million (table 1). With energy price increases in 1975, this level was probably exceeded by about 15 percent. In 1976, dollar costs may rise again as additional energy price hikes occur.

Table 1—Estimated costs of energy in poultry and egg production and marketing, 1974

	Million dollars
Production[1]	126.5
Marketing[2]	
Assembly	65.2
Primary processing	110.8
Further-processing	18.7
Long-distance transportation	73.3
Wholesaling, retailing	153.1
Total	547.6

[1] Broilers, turkey, replacements, other meat chicken, and egg production. [2] Excludes home consumption and eggs used for hatching.

The 1974 energy expenditure levels represented values of only 2 percent of gross farm income and 9 percent of farm-to-consumer marketing costs. The production of poultry and eggs alone in 1974 required 195 million gallons of propane, 49 million Therms of natural gas, 9 million gallons of fuel oil, 33 thousand tons of coal, 31 million gallons of gasoline and diesel fuel, and 1.4 billion kilowatt hours of electricity (table 2). Somewhat larger quantities of energy are required for performing various marketing activities. Large amounts of energy are also embodied in major inputs used by these industries, such as feed, and packaging and building supplies.

In production, heating fuels (propane, natural gas, fuel oil, and coal) are used mainly for brooding chicks, poults, and other newly hatched birds, with some use in incineration. Electricity is used for lighting, pumping water, ventilation and cooling, and operating automated equipment. Motor fuels (gasoline and diesel fuel) are used for on and off-farm hauling of production inputs and products, cleaning out and spreading manure and litter, and range feeding and management.

In marketing, motor fuels are required for assembling live poultry and eggs, long-distance movement of processed products, and local distribution. Heating fuels help maintain building temperatures, supply hot water, and facilitate some processing operations. Electricity is needed for lighting, air conditioning, refrigeration, and operating processing lines.

The poultry and egg industries require more energy in total than a decade ago, but use slightly less per unit of product. This is due to various factors such as economies of scale in production and marketing, increased density of supply areas, more

[1] This article is based on a draft manuscript of an Agricultural Economics Report.

Table 2--Energy use in poultry production, by type, United States, 1974

Commodity	Type of energy						
	Propane	Natural gas	Fuel oil	Coal	Gasoline	Diesel	Electricity
	(mil. gal.)	*(mil. therms)*	*(mil. gal.)*	*(1,000 tons)*	*(mil. gal.)*	*(mil. gal.)*	*(mil. kwh.)*
Broilers	122.3	23.9	6.4	18.9	6.2	---	504.1
Turkeys[1]	42.4	12.4	0.5	6.2	5.3	1.6	66.9
Hens[1]	5.1	2.7	0.5	---	9.6	1.8	828.8
Chickens[2]	23.6	5.8	1.2	6.1	5.7	0.9	14.3
Other poultry[3]	1.6	4.5	.2	1.5	0.6	---	1.8
Total[4]	194.9	49.3	8.8	32.7	27.3	4.2	1,415.9

[1] Includes breeders. [2] Mainly laying flock replacements, but includes some non-broiler meat chickens. [3] Ducks, geese, guineas, game birds, etc. [4] Numbers may not add due to rounding.

direct marketing channels, some changes in product forms, and improved technology.

Energy Problems

Adequate and timely supplies of energy are vital to maintaining output and assuring its processing and distribution. Needs can change 20 percent from one year to another solely because of weather conditions.

The use of energy by the poultry and egg industries varies seasonally. Many of the seasonal variations in production are reflected in energy needs in marketing after a time lag. Requirements for propane in production are almost 11 times as large in January as in August. For natural gas, over nine times as much is needed in January as in August. For coal, peak seasonal needs are over nine times the needs in the summer, and about 5.5 times as much fuel oil is needed in January as in the summer. Summer needs for electricity are 1 2/3 as large as in the winter.

Energy requirements for marketing follow the seasonality of poultry slaughter, egg production, and further processing. Adjustments from these patterns occur due to increased requirements for building heating in colder months and summer peaks for ventilation and cooling.

The poultry and egg industries, as large users of gas and petroleum-derived energy forms, have a certain vulnerability to increased prices and short and long-run shortages. Almost all regions are heavy users of propane for brooding and some are particularly dependent on natural gas and fuel oils. There are many instances where natural gas for brooding has been used rather inefficiently (in comparison to its heating value) because of local availability and low prices. Processing plants and other buildings used in marketing operations are often heated with natural gas even in areas far removed from natural gas producing States. Electricity needs in poultry and egg production and marketing peak during the summer months along with the needs for electricity for other purposes.

Most of the growth and development of the poultry and egg industries into the present large-scale efficient operations occurred while energy was cheap and abundant. Many changes involved the adoption of labor-saving technology through increased mechanization. Energy conservation was not a primary motivation; oftentimes more energy in total was required; however, sometimes enhanced scale of operations produced a coincidental result of more efficient energy use. But since energy costs were usually not a major item, little attention was paid to them. However, growing concerns about rising energy prices and limited energy resources now provide ample reason for heightened awareness and better energy management.

Energy Conservation

Despite the commendable record of the poultry and egg industries in reducing the quantities of energy used per unit of output, substantial opportunities exist for achieving additional savings in energy use. In the short-run, energy conservation is mainly a matter of better attention to details plus some expenditures for improvements. These can often yield dollar savings as well as help stretch available supplies.

Improved records of energy use are an essential starting point for energy conservation programs. With such records, it is easier to identify items where current use exceeds average performance standards and also to document post-adjustment savings.

Quantitatively, energy use in production may be reduced 20 to 50 percent in individual cases through such measures as partial house brooding, winterizing side curtains, more efficient lighting schedules, reduced light intensity, following proper ventilation practices, intermittent feeding, adding insulation, and improved building and equipment maintaince practices.

There are many instances where the current energy use of some producers or firms in an area is double that of other producers or firms. Energy

conservation programs thus need to be instituted and maintained.

Estimates of possible energy savings in industry range from 10-15 percent for modest efforts to 35-40 percent with major revisions in manufacturing facilities. Savings available to poultry and egg marketing firms may be of similar magnitudes. Optimum building insulation and lighting, more energy-efficient equipment, better ventilation arrangements, improved maintenance, and more attention by management are often cited as needs. Savings can also be achieved in poultry and egg assembly and feed distribution by better route planning.

Long-range Adjustments

A continuation of current concerns about energy supplies and prices and a gradual worsening of the energy crisis can activate widespread changes relating to the energy programs of the poultry and egg industries. These may involve alternative energy forms, structural and institutional changes, substantial capital outlays, and closer relationships with other firms. Many technical, economic, and legal problems surrounding these matters need to be studied.

Some alternative energy sources are: solar energy collection, methane generation, or wind power. Future energy systems may be more mixed in nature than those presently in use, as partial contributions from several sources and "waste" heat saving are integrated into a total package. Solar energy for heating broiler houses is being widely studied, but projected initial costs are high. Solar energy might also be used for other heating and cooling functions. Methane generation involves complex technical and economic issues.

Modification of existing transportation regulations could enhance energy use efficiency and permit more combined-mode arrangements. Greater use of rail movement—given faster movements and better handling—could save costs per ton mile compared with truck movement. Energy-related conflicts between various regulatory programs need to be resolved. Shipping in vacumized containers offers possibilities. A reexamination of irradiation preservation under conditions of large-scale, multiple-commodity operations, and perhaps with public financial aid, is in order. Simplification and standardization of packaging and containers is another possiblity. Another area for study is the substitution of decentralized retailing and direct systematic home deliveries for the present system, which involves much individual travel by consumers to shopping centers.

Poultry and egg firms may also become more involved with on-site private power generation groups to reduce transmission costs and dependency on regional public systems and use wastes. Development of energy parks, involving one or more conventional or nuclear generating plants, could involve the production, processing, and waste programs of poultry and egg firms in a totally integrated system.

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